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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

October 1998

Data Assimilation
Meteorological Office
London Rd
Bracknell
Berkshire
RG12 2SZ

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

Dr. B. Macpherson
Head of Observation Processing and Monitoring Section
Data Assimilation
Meteorological Office
London Road
Bracknell
Berkshire
United Kingdom
RG12 2SZ

2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-11 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
6. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
7. January 1998. Increase in resolution of UKMO global forecast model.
8. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
9. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
10. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
11. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
12. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.| bias|	≥ 4 hPa	(pressure),
	> 5 m s^{-1}	(wind speed),
	> 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	> 80 degrees	(direction).
3.PGE	> 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
C6CU6	ALL	P	SUR	34	6	18	4.3	-4.5	6.2
C6FA6	ALL	P	SUR	40	0	0	3.4	-4.2	5.4
ELRT5	ALL	P	SUR	25	9	36	8.1	10.0	12.8
PCCZ	ALL	P	SUR	24	1	4	1.0	5.4	5.5
PCEX	ALL	P	SUR	32	0	0	1.9	8.9	9.1
PDYV	ALL	P	SUR	40	10	25	3.8	-1.2	4.0
PEXX	ALL	P	SUR	55	0	0	1.6	-4.6	4.9
PFSK	ALL	P	SUR	20	0	0	2.1	-4.9	5.4
P3YS5	ALL	P	SUR	73	0	0	1.3	4.8	5.0
VCTV	ALL	P	SUR	26	12	46	4.3	3.7	5.7
VGKM	ALL	P	SUR	25	9	36	4.0	-6.7	7.8
VRVI2	ALL	P	SUR	49	0	0	1.0	5.1	5.2
WCV7620	ALL	P	SUR	29	0	0	2.2	5.2	5.7
WDZB	ALL	P	SUR	31	0	0	1.4	-6.0	6.1
WDZG	ALL	P	SUR	59	0	0	0.8	-4.1	4.2
ZCBF6	ALL	P	SUR	55	1	2	1.8	5.3	5.6
3FGQ3	ALL	P	SUR	57	0	0	1.1	9.0	9.1
3FOW4	ALL	P	SUR	43	0	0	1.4	4.6	4.8
WIND SPEED									
C6PE4	ALL	SPEED	SUR	64	0	0	5.3	10.4	11.6
DDHOUD	ALL	SPEED	SUR	37	4	11	7.2	7.5	10.4
DPRH	ALL	SPEED	SUR	44	0	0	5.4	5.0	7.4
DQVK	ALL	SPEED	SUR	116	0	0	5.8	5.1	7.7
DUQM	ALL	SPEED	SUR	56	2	4	5.8	8.9	10.6
DZFF	ALL	SPEED	SUR	89	1	1	2.3	6.6	7.0
ELGD4	ALL	SPEED	SUR	46	0	0	2.6	5.0	5.6
ELRR2	ALL	SPEED	SUR	65	1	2	4.3	6.0	7.4
FNJI	ALL	SPEED	SUR	129	6	5	6.0	7.1	9.3
FNZP	ALL	SPEED	SUR	90	1	1	6.0	7.0	9.2
GYZW	ALL	SPEED	SUR	37	3	8	6.7	12.0	13.7
MXWJ5	ALL	SPEED	SUR	79	3	4	8.0	8.5	11.7
OUEK	ALL	SPEED	SUR	107	0	0	6.8	6.6	9.5
OVUN6	ALL	SPEED	SUR	129	0	0	5.6	5.3	7.8
OXRA6	ALL	SPEED	SUR	43	0	0	3.8	5.6	6.8
PFRO	ALL	SPEED	SUR	41	0	0	5.1	5.3	7.4
PJOX	ALL	SPEED	SUR	76	0	0	3.9	7.1	8.1
VRUN4	ALL	SPEED	SUR	37	0	0	2.7	5.6	6.2
ZCAK4	ALL	SPEED	SUR	46	0	0	7.3	5.3	9.1
ZCBD4	ALL	SPEED	SUR	20	0	0	3.0	-7.0	7.6
ZCBL5	ALL	SPEED	SUR	47	0	0	6.6	6.8	9.5
3BIX	ALL	SPEED	SUR	30	0	0	2.2	5.5	5.9
3EMW5	ALL	SPEED	SUR	28	7	25	7.8	10.6	13.2
3FSL4	ALL	SPEED	SUR	20	1	5	4.1	5.7	7.0
9KKF	ALL	SPEED	SUR	26	1	4	4.7	6.1	7.7
9MBK8	ALL	SPEED	SUR	21	0	0	5.5	7.0	8.9
WIND DIRECTION									
DEDI	ALL	DIRN.	SUR	181	0	0	95.3	10.9	96.0
ELVH7	ALL	DIRN.	SUR	30	0	0	93.7	-1.8	93.7
ELVY8	ALL	DIRN.	SUR	20	0	0	28.9	31.3	42.6
FNAV	ALL	DIRN.	SUR	35	0	0	20.1	33.7	39.3
J8CV5	ALL	DIRN.	SUR	29	0	0	20.3	-37.4	42.5
LAKW2	ALL	DIRN.	SUR	25	0	0	86.6	17.7	88.4
45138	ALL	DIRN.	SUR	41	0	0	36.2	-40.9	54.6
63104	ALL	DIRN.	SUR	31	0	0	111.2	4.4	111.3
63112	ALL	DIRN.	SUR	21	0	0	110.2	-3.8	110.3

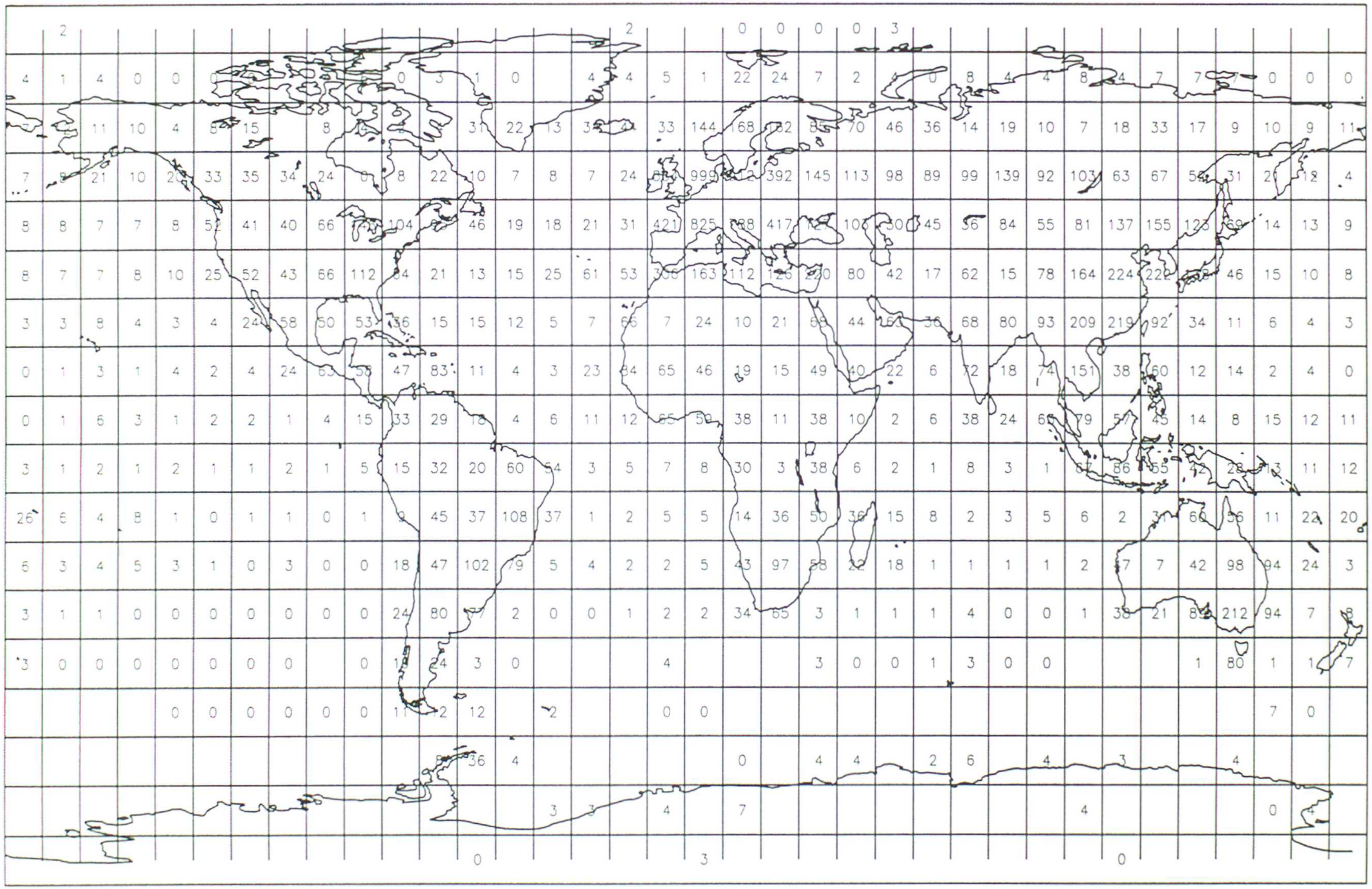
AVAILABILITY – SHIP/SYNOP – OCTOBER 1998

FIGURE 1

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 19670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7 8 21 10 20 33 35 34 24 0 8 22 10 7 8 7 24 85 999 82 392 145 113 98 89 99 139 92 103 63 67 58 31 21 12 4
8 8 7 7 8 52 41 40 66 144 104 46 19 18 21 31 421 825 188 417 127 106 300 45 36 84 55 81 137 155 123 69 14 13 9
8 7 7 8 10 25 52 43 66 112 34 21 13 15 25 61 53 306 163 112 126 220 80 42 17 62 15 78 164 224 222 46 15 10 8
3 3 8 4 3 4 24 58 50 53 36 15 15 12 5 7 66 7 24 10 21 63 44 16 36 68 80 93 209 219 92 34 11 6 4 3
0 1 3 1 4 2 4 24 63 58 47 83 11 4 3 23 84 65 46 19 15 49 40 22 6 72 18 74 151 38 60 12 14 2 4 0
0 1 6 3 1 2 2 1 4 15 33 29 18 4 6 11 12 65 58 38 11 38 10 2 6 38 24 65 79 57 45 14 8 15 12 11
3 1 2 1 2 1 1 2 1 5 15 32 20 60 54 3 5 7 8 30 3 38 6 2 1 8 3 1 67 86 55 42 28 13 11 12
26 6 4 8 1 0 1 1 0 1 9 45 37 108 37 1 2 5 5 14 36 50 36 15 8 2 3 5 6 2 31 60 56 11 22 20
6 3 4 5 3 1 0 3 0 0 18 47 102 79 5 4 2 2 5 43 97 58 22 18 1 1 1 1 2 17 7 42 98 94 24 3
3 1 1 0 0 0 0 0 0 0 24 80 77 2 0 0 1 2 2 34 65 3 1 1 1 4 0 0 1 38 21 83 212 94 7 8
3 0 0 0 0 0 0 0 0 18 24 3 0 4 3 0 0 1 3 0 0 1 80 1 1 7
0 0 0 0 0 0 11 2 12 2 0 0 7 0
8 36 4 0 4 4 2 6 4 3 4
3 3 4 7 4 0 4
0 3 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.| bias| ≥ 4 hPa (pressure),
> 5 m s^{-1} (wind speed),
> 30 degrees (direction).

2.SD ≥ 6 hPa (pressure),
> 80 degrees (direction).

3.PGE ≥ 25.

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
21627	37.7	129.0	ALL	P	SUR	179	0	0	1.0	-8.9	8.9
46559	21.2	-131.8	ALL	P	SUR	144	0	0	1.1	-7.3	7.4
46624	33.8	-138.1	ALL	P	SUR	209	0	0	1.3	-4.1	4.4
47601	74.1	-128.7	ALL	P	SUR	699	303	43	5.6	-2.0	5.9
48519	75.1	-137.1	ALL	P	SUR	306	269	88	0.8	-0.4	0.9
62511	48.3	-16.4	ALL	P	SUR	660	236	36	1.7	0.5	1.8
62516	45.5	-11.8	ALL	P	SUR	27	0	0	2.0	-4.5	4.9
WIND SPEED											
41520	22.5	-44.4	ALL	SPEED	SUR	299	4	1	3.8	6.0	7.1
WIND DIRECTION											
13501	9.2	-21.3	ALL	DIRN.	SUR	105	0	0	88.3	-5.9	88.5
41503	21.6	-57.6	ALL	DIRN.	SUR	247	0	0	37.2	35.3	51.3
46535	37.6	-131.3	ALL	DIRN.	SUR	547	0	0	50.6	37.9	63.2
46540	37.6	-141.2	ALL	DIRN.	SUR	22	0	0	89.4	49.4	102.1
46551	41.4	-158.1	ALL	DIRN.	SUR	112	2	2	22.0	-32.4	39.1
46560	40.9	-137.0	ALL	DIRN.	SUR	583	0	0	52.3	-91.6	105.5
46562	43.6	-134.3	ALL	DIRN.	SUR	355	0	0	80.0	58.2	98.9
46606	35.6	-144.8	ALL	DIRN.	SUR	527	0	0	57.8	31.1	65.6
52534	10.1	125.7	ALL	DIRN.	SUR	20	0	0	35.9	-88.0	95.1
52540	13.4	144.7	ALL	DIRN.	SUR	203	0	0	18.3	57.6	60.5
52624	-13.9	138.5	ALL	DIRN.	SUR	167	0	0	96.8	-0.6	96.8
55587	-40.9	163.1	ALL	DIRN.	SUR	492	0	0	18.1	35.3	39.7

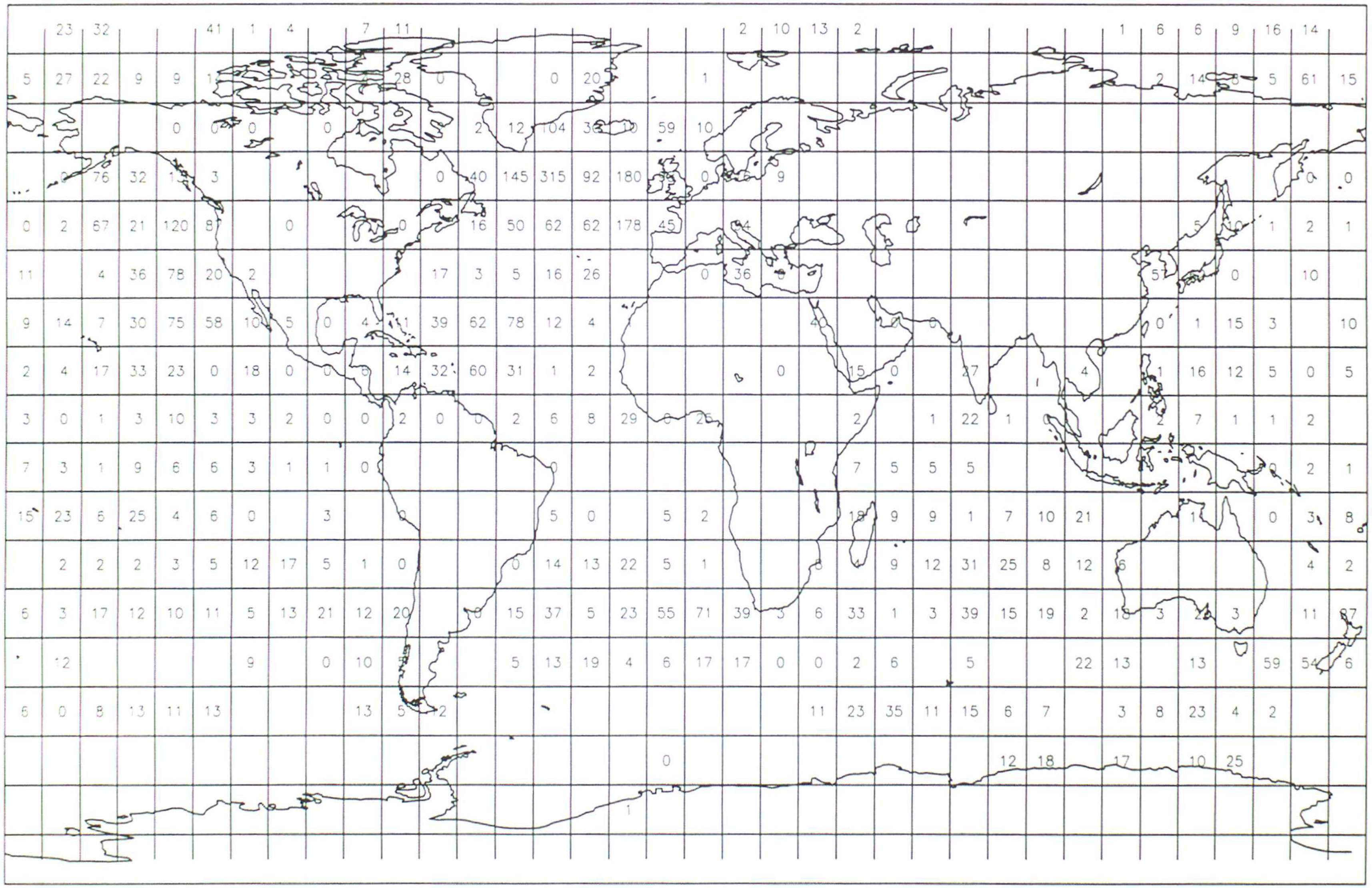
AVAILABILITY – DRIFTER – OCTOBER 1998

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 5497

FIGURE 2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0 2 67 21 120 8 0 0 16 50 62 62 178 45 34 5 10 1 2 1
11 4 36 78 20 2 17 3 5 16 26 0 36 57 0 10
9 14 7 30 75 58 10 5 0 4 1 39 62 78 12 4 4 0 0 0 1 15 3 10
2 4 17 33 23 0 18 0 0 6 14 32 60 31 1 2 0 15 0 27 4 1 16 12 5 0 5
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7 3 1 9 6 6 3 1 1 0 0 7 5 5 5 0 2 1
15 23 6 25 4 6 0 3 0 5 0 5 2 18 9 9 1 7 10 21 1 0 3 8
2 2 2 3 5 12 17 5 1 0 0 14 13 22 5 1 8 9 12 31 25 8 12 6 4 2
6 3 17 12 10 11 5 13 21 12 20 0 15 37 5 23 55 71 39 3 6 33 1 3 39 15 19 2 18 3 22 3 11 87
12 9 0 10 5 5 13 19 4 6 17 17 0 0 2 6 5 22 13 13 59 54 6
6 0 8 13 11 13 13 5 12 11 23 35 11 15 6 7 3 8 23 4 2
0 12 18 17 10 25
1

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.| bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	> 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	111	0	0	2	1.2	4.5	4.7
60468	35.6N	6.2E	1052	S8	76	76	100	1	0.0	0.0	0.0
60511	35.3N	1.4E	1127	S8	110	89	81	1	0.4	14.4	14.4
60535	34.7N	3.3E	1144	S8	83	0	0	1	1.0	-6.0	6.1
60571	31.6N	2.2W	773	S8	113	1	1	0	0.9	-4.1	4.2
60670	24.6N	9.5E	1054	S8	115	0	0	0	0.9	9.4	9.4
63330	13.5N	39.5E	2070	MS	51	51	100	2	0.0	0.0	0.0
63334	10.3N	37.7E	2515	MS	62	0	0	6	0.9	10.3	10.3
63402	7.7N	36.8E	1725	MS	102	0	0	1	1.4	7.0	7.1
63450	9.0N	38.8E	2354	MS	107	0	0	1	0.7	4.7	4.8
63471	9.6N	41.9E	1260	MS	87	0	0	1	1.0	9.9	10.0
63478	5.9N	43.6E	295	S	41	0	0	5	3.2	5.9	6.7
68030	18.5S	25.6E	1071	8	61	1	2	11	1.0	4.3	4.4
68343	27.6S	25.6E	1228	S8	87	0	0	101	1.2	-9.1	9.2
68396	26.5S	31.3E	641	S8	49	0	0	2	1.5	4.2	4.5

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30320	56.9N	105.7E	669	MS	112	57	51	1	1.7	0.5	1.8
30554	54.5N	113.6E	995	MS	114	0	0	52	4.5	5.7	7.3
38750	37.5N	53.6E	-22	MS	32	0	0	50	3.7	-4.6	5.9
40743	36.2N	57.7E	941	MS	104	0	0	0	1.1	-4.7	4.8
40762	35.3N	59.2E	1333	MS	101	13	13	1	0.8	-13.4	13.4
41254	23.1N	57.7E	1755	S8	74	74	100	1	0.0	0.0	0.0
41396	16.0N	48.9E	700	MS	23	0	0	70	1.2	5.6	5.7
41535	34.2N	73.3E	1308	8	39	0	0	5	2.0	-5.2	5.6
44477	27.0N	87.4E	1445	S8	52	52	100	2	0.0	0.0	0.0
51334	44.6N	82.9E	321	M	116	0	0	25	2.2	4.2	4.7
52602	38.8N	93.4E	2734	S	116	0	0	1	1.2	-6.5	6.6
53588	39.0N	113.5E	2898	S	115	115	100	1	0.0	0.0	0.0
54587	39.1N	123.2E	66	M	106	0	0	5	2.0	-5.0	5.4
56144	31.8N	98.6E	3184	S	103	0	0	1	1.5	-4.6	4.8
56385	29.5N	103.3E	3049	S	116	0	0	0	1.3	-5.6	5.7
56444	28.5N	98.9E	3488	S	111	7	6	1	0.7	13.7	13.7
56462	29.0N	101.5E	2994	S	116	0	0	0	1.3	8.4	8.5
56954	22.6N	99.9E	1054	M	116	0	0	1	0.9	4.4	4.5
57006	34.6N	105.8E	1143	M	116	0	0	1	1.4	4.0	4.2

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	23	1	4	4	2.1	-5.1	5.5
82326	3.8S	62.1W	48	MS	80	0	0	15	1.8	4.4	4.8
82704	7.6S	72.7W	170	MS	73	0	0	0	1.4	-4.7	4.9
83186	11.2S	40.5W	485	MS	77	0	0	31	1.1	-4.4	4.5
83214	10.3S	54.9W	285	MS	53	0	0	2	1.7	-5.8	6.0
83235	12.4S	46.4W	604	MS	81	0	0	0	0.9	6.0	6.1
83319	14.7S	52.4W	315	MS	59	0	0	0	1.3	-4.7	4.9
83332	14.1S	46.4W	826	MS	78	5	6	0	1.6	12.7	12.8
83361	15.6S	56.1W	151	MS	82	0	0	6	1.5	4.3	4.6
83408	14.3S	43.8W	447	MS	76	2	3	3	0.9	10.2	10.2
83423	16.7S	49.3W	741	MS	79	0	0	1	1.0	-5.7	5.8
83488	17.8S	42.9W	1097	MS	82	82	100	0	0.0	0.0	0.0
83531	18.6S	46.5W	940	MS	77	2	3	1	1.3	-6.8	6.9
83587	19.9S	43.9W	850	MS	83	0	0	0	1.0	-6.9	7.0
83773	23.1S	48.9W	793	S	41	1	2	0	1.3	-6.4	6.5

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
84401	5.2S	80.6W	49	MS	20	0	0	0	1.6	5.4	5.6
84501	8.1S	79.0W	26	MS	21	0	0	0	0.9	4.3	4.4
84628	12.0S	77.1W	12	MS	23	0	0	0	0.7	4.0	4.1
84782	18.1S	70.3W	468	MS	22	0	0	0	1.3	7.2	7.3
85312	19.8S	63.9W	992	S	37	37	100	35	0.0	0.0	0.0
85406	18.3S	70.3W	55	M	109	0	0	1	1.3	6.0	6.1
85418	20.5S	70.2W	48	M	111	0	0	0	1.1	4.2	4.3

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70264	63.3N	149.1W	734	S	21	2	10	62	3.9	6.3	7.4
71882	51.0N	118.2W	443	MS	111	0	0	31	2.9	4.0	4.9
72376	36.8N	108.2W	1677	M	36	0	0	8	1.5	4.5	4.7
76118	30.4N	109.7W	1040	MS	39	0	0	0	0.7	-9.7	9.7
76551	21.5N	106.6W	4	MS	28	0	0	0	2.9	6.1	6.8
76625	20.6N	100.4W	1813	MS	50	0	0	2	1.0	-7.3	7.4
76632	20.1N	98.7W	2417	MS	30	0	0	0	0.6	-5.5	5.5
76658	19.2N	103.7W	494	MS	46	0	0	0	1.0	6.9	7.0
76698	19.6N	88.0W	20	MS	84	0	0	0	1.3	-5.6	5.7
76775	17.1N	96.7W	1550	MS	52	2	4	0	1.0	4.8	4.9
76845	16.7N	92.6W	2276	MS	90	89	99	1	0.0	13.7	13.7
78718	14.4N	87.6W	626	MS	58	30	52	0	0.8	-13.9	13.9

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94328	22.4S	133.6E	623	MS	68	0	0	0	0.7	6.5	6.5
94955	41.6S	145.7E	684	MS	111	111	100	1	0.0	0.0	0.0
95952	41.9S	145.6E	560	MS	110	110	100	1	0.0	0.0	0.0

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
02045	67.8N	20.4E	408	M	42	42	100	0	0.0	0.0	0.0
11034	48.2N	16.4E	171	MS	56	0	0	75	1.7	4.0	4.3
16227	41.9N	13.6E	655	MS	113	105	93	0	0.6	-14.1	14.1
16614	40.4N	21.3E	604	MS	102	0	0	0	1.0	-6.1	6.2
17092	39.8N	39.5E	1218	S8	110	0	0	0	1.4	7.2	7.3
17203	38.9N	40.5E	1177	S8	108	0	0	0	1.1	4.4	4.5

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89264	71.4S	68.9W	780	S	243	0	0	1	2.9	4.5	5.4
89345	81.7S	148.8W	620	S	374	89	24	18	4.2	-7.9	8.9

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	84	0	18	2.3	1.2	81	0	17	0	9.9	2.1
AAH	61	3	25	3.5	2.6	62	2	19	0	7.2	1.6
AAL	6674	1	31	1.8	0.0	5502	0	24	0	8.3	1.0
AAR	1376	1	7	1.8	-0.6	1375	0	9	0	8.8	0.6
ACA	1909	1	12	2.0	0.0	1769	0	7	0	8.1	0.6
ACI	63	0	38	1.3	-0.1	63	0	38	0	9.4	2.6
AEA	646	1	28	2.4	1.1	546	0	22	0	9.3	0.2
AEL	528	0	14	2.5	0.6	523	0	14	0	9.0	0.0
AEY	99	1	7	1.9	0.6	97	1	4	0	7.3	0.3
AFL	581	0	11	2.4	0.9	531	1	7	0	8.0	1.1
AFR	2047	0	13	1.8	0.1	2021	0	13	0	8.1	0.9
AIH	210	1	7	1.5	-0.1	202	0	6	0	8.0	0.5
AJM	97	0	8	1.7	-0.3	90	1	7	0	7.7	-0.3
AMT	672	1	44	2.0	1.0	665	0	44	0	8.2	0.9
AMX	307	1	5	1.8	0.1	306	0	4	0	9.0	0.9
ANA	1190	0	5	1.8	-0.2	1185	0	5	0	7.8	1.0
ANO	31	0	3	1.4	0.6	31	0	3	0	6.2	2.9
ANZ	3693	1	40	2.0	-0.1	3656	0	39	0	8.9	0.9
AOM	650	1	8	1.9	0.8	645	0	7	0	8.7	0.6
ARG	74	4	14	2.7	0.7	73	0	10	0	10.0	0.4
AUA	41	0	32	2.3	0.3	26	0	19	0	9.1	1.1
AVA	509	1	5	1.5	0.0	509	1	7	0	10.2	0.3
AVN	92	0	5	1.1	0.2	92	0	5	0	9.3	-0.9
AXA	131	1	43	1.7	0.4	130	0	42	0	7.9	1.5
AZA	479	7	34	3.1	0.8	415	0	15	0	9.1	0.5
BAL	813	1	17	1.6	-0.3	786	0	15	0	7.8	0.6
BAW	2034	0	23	1.9	-0.1	1766	0	18	0	8.2	0.8
BWA	397	1	15	1.9	1.3	357	0	8	0	7.6	0.8
CAL	2031	1	7	1.6	-0.2	2030	0	8	0	9.0	0.6
CCA	279	1	14	2.7	0.7	312	1	19	0	13.7	-0.2
CDN	2477	0	11	1.8	0.2	2358	0	9	0	8.2	0.6
CES	314	0	7	1.7	0.3	325	2	10	0	10.1	0.1
CFG	1039	0	8	1.8	-0.9	984	0	5	0	9.0	0.2
CKS	408	0	43	1.5	0.2	452	0	43	1	7.2	0.5
CKT	267	0	25	2.0	0.7	231	1	17	0	9.2	0.3
CLX	431	1	12	2.0	-0.6	397	0	6	0	7.7	0.4
CMI	500	1	6	1.4	0.6	494	0	4	0	7.3	1.2
CMM	646	0	20	1.7	-0.1	584	0	15	0	8.2	1.0
COA	1831	0	32	1.7	0.1	1625	0	31	0	10.5	1.6
CPA	91	2	9	1.6	-0.2	87	1	9	0	8.3	0.4
CRL	483	1	9	1.7	0.4	473	0	9	0	8.6	0.8
CSN	79	1	10	2.3	0.7	80	0	8	0	8.7	0.6
CTB	271	0	3	1.6	-0.6	272	0	6	0	8.0	0.8
CTM	40	0	8	1.7	0.8	40	0	8	0	6.7	0.7
CUB	516	1	11	2.2	1.1	507	0	9	0	9.5	0.5
DAL	5462	1	42	2.2	0.6	4409	0	34	0	7.7	0.8
DBY	360	1	5	1.8	-0.9	361	0	4	0	7.8	0.4
DHL	36	8	100	5.4	-3.3	28	0	25	0	14.1	0.7
DLH	3037	0	17	1.8	0.0	2784	0	13	0	8.2	0.9
EIA	304	1	35	2.3	1.3	294	0	37	0	8.3	1.1
EIN	29	0	28	2.2	-0.1	25	0	20	0	14.5	2.7
ELY	110	0	11	1.6	0.1	109	1	85	6	8.5	1.1
EVA	2381	1	6	1.5	-0.3	2421	0	7	0	8.4	0.3
EWW	75	0	29	1.8	0.1	52	0	100	0	8.7	0.7
FDX	1813	1	25	1.7	0.5	1634	0	19	0	8.0	0.8
FIN	316	0	23	2.1	0.5	248	1	13	0	7.6	0.2
FJI	924	4	40	1.5	0.1	888	0	38	1	9.1	0.8
FOM	238	5	46	1.5	0.4	228	0	44	1	10.2	0.7
GAF	30	0	17	1.8	-0.7	29	0	7	0	9.7	4.3

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GHA	27	4	7	1.4	0.3	27	0	7	0	8.0	1.9
GIA	48	0	31	1.9	1.4	49	0	31	0	7.2	2.4
GTI	129	1	29	2.1	0.2	114	0	17	0	8.7	0.4
HAL	3018	0	37	1.5	0.3	2969	0	37	0	8.7	1.3
HLF	89	0	21	1.6	-0.8	78	0	12	0	6.7	1.3
HRH	103	7	56	1.4	0.3	94	0	52	0	9.2	2.1
IBE	2708	1	22	1.9	0.6	2484	0	19	0	9.1	0.4
ICE	1098	1	77	2.1	0.3	867	0	15	0	7.5	0.2
JAL	6746	0	5	1.7	0.1	6729	0	5	0	8.4	0.8
JAZ	55	2	7	2.0	1.5	55	0	7	0	8.5	0.8
JKK	264	1	25	1.6	0.1	215	0	18	0	9.4	0.6
KAL	3424	1	10	1.8	-0.3	3416	0	9	0	8.9	0.7
KLM	3178	0	19	1.6	0.1	3081	0	18	0	7.6	0.7
LAN	31	0	0	2.1	0.2	30	0	0	0	8.1	-1.2
LAP	40	3	5	3.3	1.7	40	0	100	0	12.9	1.3
LDA	144	0	22	2.2	-0.3	131	0	14	1	8.2	0.6
LDI	392	1	34	3.6	2.5	332	0	27	0	10.9	-0.2
LEI	184	3	18	1.7	0.6	164	0	10	0	7.5	0.8
LIB	266	1	6	1.7	1.0	259	0	6	0	7.1	0.8
LOT	182	1	24	1.9	-1.1	140	0	14	1	6.6	-0.1
LTU	772	1	21	1.8	-0.2	663	0	13	0	7.8	0.6
LXR	85	0	12	1.7	0.8	85	0	12	0	10.8	-0.2
MAS	413	1	10	1.6	-0.2	453	1	10	0	9.2	1.0
MDA	109	0	3	2.0	0.7	111	0	4	0	9.7	-0.8
MON	169	4	15	2.2	-0.1	152	1	9	1	9.5	2.0
MPD	241	2	15	2.1	0.9	217	0	9	0	8.0	0.7
MPH	950	0	9	1.7	-0.6	892	0	5	0	7.2	0.3
NCA	624	0	3	1.6	0.1	625	0	5	0	8.8	0.5
NJS	22	0	18	1.8	1.2	22	0	14	0	4.9	-0.4
NWA	10423	1	13	1.8	0.5	10142	0	12	0	8.6	0.7
PAC	205	1	24	2.2	0.4	188	1	20	0	10.5	0.8
PAL	43	0	9	1.8	0.2	43	0	16	0	9.6	0.9
PAO	311	3	43	1.4	0.1	307	0	41	0	10.2	0.9
PAQ	38	0	5	1.4	-0.5	38	0	8	0	9.0	0.8
QFA	1989	1	41	1.8	0.0	1988	1	41	0	10.2	0.1
RAF	128	2	4	2.1	0.9	127	0	4	0	8.8	1.6
RAM	93	0	9	2.4	0.2	92	0	5	0	10.3	0.9
RCH	460	2	23	2.0	0.5	438	1	25	0	10.8	1.2
RJA	44	0	30	2.3	1.2	34	0	12	0	7.1	0.3
RKA	88	1	5	1.8	-0.6	88	0	3	0	9.1	0.9
ROY	61	2	13	1.4	-0.2	55	0	5	0	7.8	1.3
RRR	100	1	28	1.6	-0.3	89	0	27	0	8.2	0.9
RYN	294	0	44	1.5	0.1	293	0	44	0	8.4	0.6
SAA	329	1	6	1.7	-0.2	320	0	7	0	9.5	0.7
SAB	86	1	19	1.5	0.1	77	0	8	0	6.2	1.8
SAS	1359	0	2	1.9	0.0	1350	0	2	0	7.2	0.2
SIA	1455	1	7	1.7	-0.6	1458	0	7	0	8.0	0.5
SLR	146	0	15	1.4	-0.5	146	1	16	0	8.8	0.2
SOL	62	2	3	0.9	0.1	62	0	8	0	9.0	1.4
SVA	68	1	10	1.8	0.0	75	0	7	0	7.3	0.6
SVV	24	0	8	2.8	-1.1	23	0	17	0	15.0	4.8
SWR	242	0	22	1.7	0.0	198	1	15	0	9.2	1.4
TAP	695	0	8	1.5	-0.3	683	0	7	0	8.3	1.0
TBA	37	0	38	3.2	1.6	36	0	44	0	17.4	0.4
TCO	22	0	0	1.3	0.4	22	5	5	0	8.8	0.9
THA	489	0	7	1.8	-0.5	488	0	8	0	9.2	0.3
TOW	128	5	29	1.9	0.0	104	0	15	3	7.6	0.5
TPA	20	5	15	1.4	0.6	20	0	15	0	5.3	1.1
TSC	77	0	9	2.1	0.2	73	0	7	0	8.9	1.3

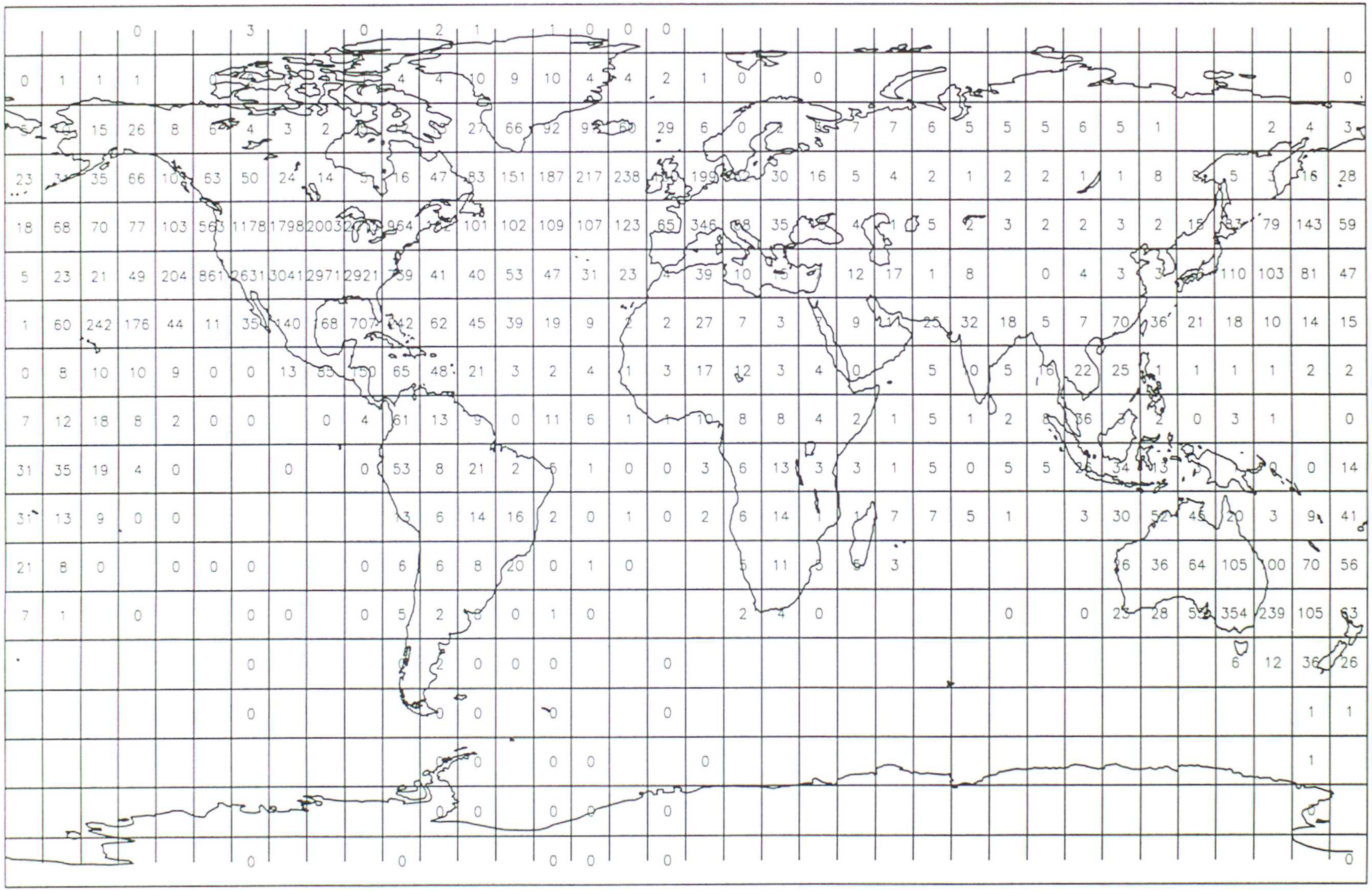
	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TSO	21	0	5	2.5	0.8	21	0	0	0	5.8	0.3
TWA	1456	0	34	2.2	0.7	1129	0	23	0	8.2	0.9
UAL	93425	1	87	1.3	-0.1	93089	0	87	1	6.4	0.7
UPS	1559	1	37	1.8	0.2	1447	0	35	0	8.1	0.7
USA	257	1	33	2.0	0.0	200	1	21	0	9.0	0.5
VHC	23	0	26	3.2	2.3	23	0	26	0	7.4	2.2
VIR	348	0	12	1.9	-0.4	321	0	6	0	7.7	1.1
VKG	96	0	15	1.5	0.4	89	1	11	0	6.6	0.3
VRG	308	2	36	2.5	0.9	270	0	100	2	11.8	1.2
VSP	218	0	18	1.9	0.3	207	0	18	1	9.7	1.6
VVJ	20	10	30	2.0	-0.7	21	0	24	0	4.6	-0.9
VVR	20	0	45	2.5	0.9	20	0	40	0	8.4	6.0
WOA	127	1	17	1.5	0.1	121	0	13	0	9.2	2.2
ZKN	2044	0	0	1.6	0.1	2044	0	0	0	7.3	1.2
AN	20560	0	1	1.5	0.2	20560	0	1	0	6.3	0.9
BA	30653	2	8	1.9	0.5	30597	0	4	0	6.7	0.8
IT	453	0	50	1.1	-0.1	453	0	50	0	6.9	1.5
KL	7479	0	13	1.5	0.9	7473	0	13	0	6.3	0.7
LH	3104	0	1	1.7	1.0	3183	0	1	0	6.9	1.0
MK	2396	0	0	1.9	1.3	2391	0	0	0	8.3	0.7
QF	17300	0	2	1.3	0.4	17295	0	1	0	6.4	0.8
SA	2739	3	3	1.9	1.4	2737	0	3	0	9.4	1.5
SV	1833	0	0	1.7	1.3	1825	0	0	0	6.1	0.3
UA	3995	1	36	1.4	0.0	4198	0	35	0	8.7	1.5
WA	881	6	12	2.0	0.6	864	5	19	0	11.0	-1.6
XX	4194	2	5	1.6	0.4	4765	0	100	0	13.6	1.5
N	682	1	27	2.5	0.6	654	0	22	0	9.4	0.9
ADS	1684	0	1	1.3	0.0	1684	0	70	0	5.8	0.4
US ACAR	531346	0	8	1.2	0.2	531293	0	9	0	6.3	0.8

MEAN DAILY COUNT OF AIRCRAFT 70 - 500 HPA

OCTOBER 1998

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

FIGURE 3


0 3 0 2 1 1 0 0 0
0 1 1 1 0 4 4 10 9 10 4 4 2 1 0 0 0
5 10 15 26 8 6 4 3 2 0 2 2 27 66 92 93 60 29 6 0 2 3 7 7 6 5 5 5 6 5 1 2 4 3
23 31 35 66 10 63 50 24 14 5 16 47 83 151 187 217 238 199 30 16 5 4 2 1 2 2 1 1 8 8 5 3 16 28
18 68 70 77 103 563 1178 1798 2003 964 101 102 109 107 123 65 346 68 35 4 1 5 2 3 2 2 3 2 15 79 143 59
5 23 21 49 204 861 2631 3041 2971 2921 759 41 40 53 47 31 23 4 39 10 12 17 1 8 0 4 3 3 110 103 81 47
1 60 242 176 44 11 35 140 168 707 142 62 45 39 19 9 2 2 27 7 3 9 25 32 18 5 7 70 36 21 18 10 14 15
0 8 10 10 9 0 0 13 53 150 65 48 21 3 2 4 1 3 17 12 3 4 0 5 10 5 16 22 25 1 1 1 1 2 2
7 12 18 8 2 0 0 0 4 61 13 9 0 11 6 1 1 10 8 8 4 2 1 5 1 2 8 36 3 2 0 3 1 0
31 35 19 4 0 0 0 53 8 21 2 5 1 0 0 3 6 13 3 3 1 5 0 5 5 26 34 13 0 0 14
31 13 9 0 0 13 6 14 16 2 0 1 0 2 6 14 1 1 7 7 5 1 3 30 52 45 20 3 9 41
21 8 0 0 0 0 0 6 6 8 20 0 1 0 5 11 5 5 3 16 36 64 105 100 70 56
7 1 0 0 0 0 5 2 3 0 1 0 2 4 0 0 0 23 28 53 354 239 105 63
0 0 2 0 0 0 0 6 12 36 26
0 0 0 0 0 1 1
0 0 0 0 0 1
0 0 0 0 0 0
0 0 0 0 0 0

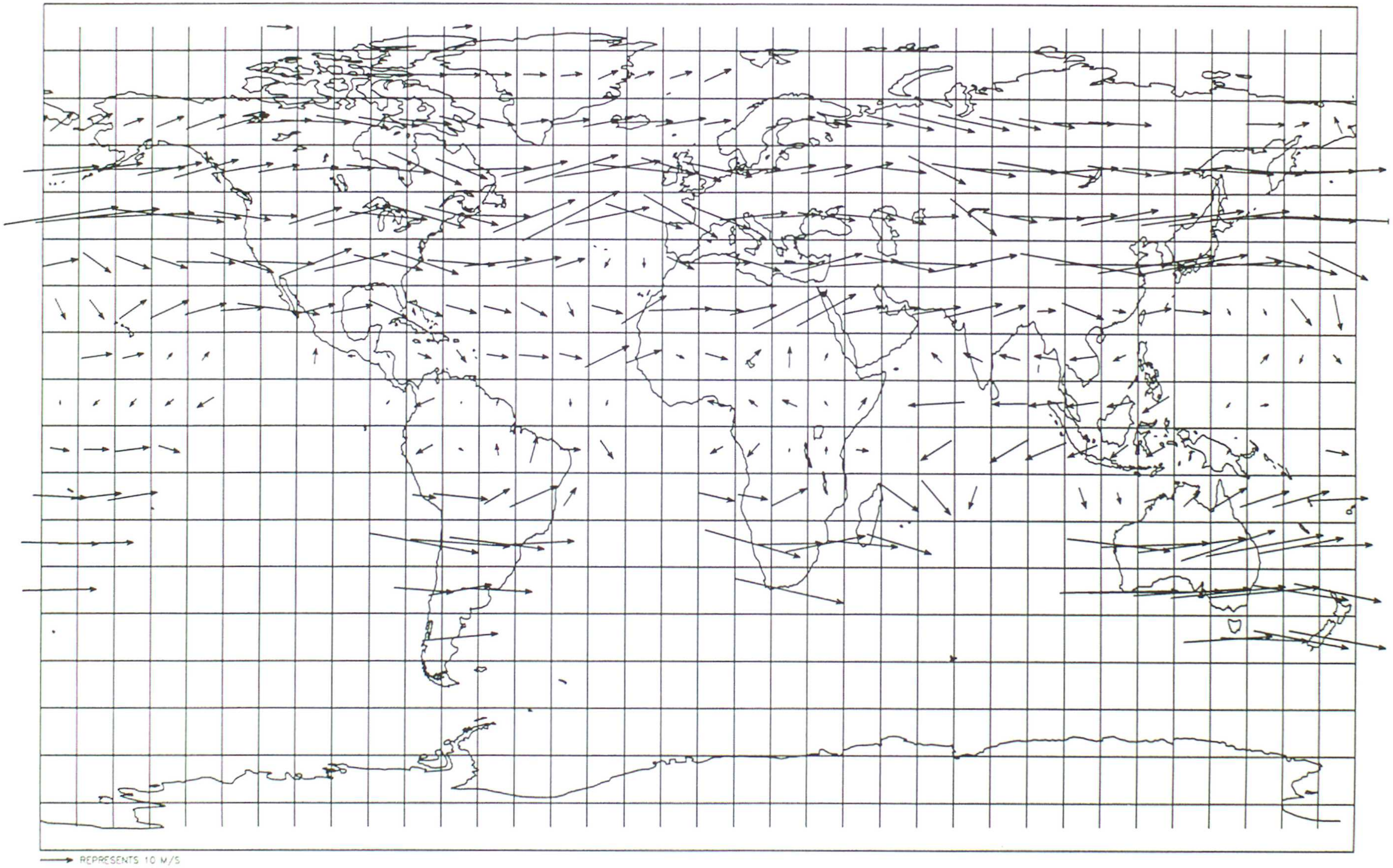
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

OCTOBER 1998

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

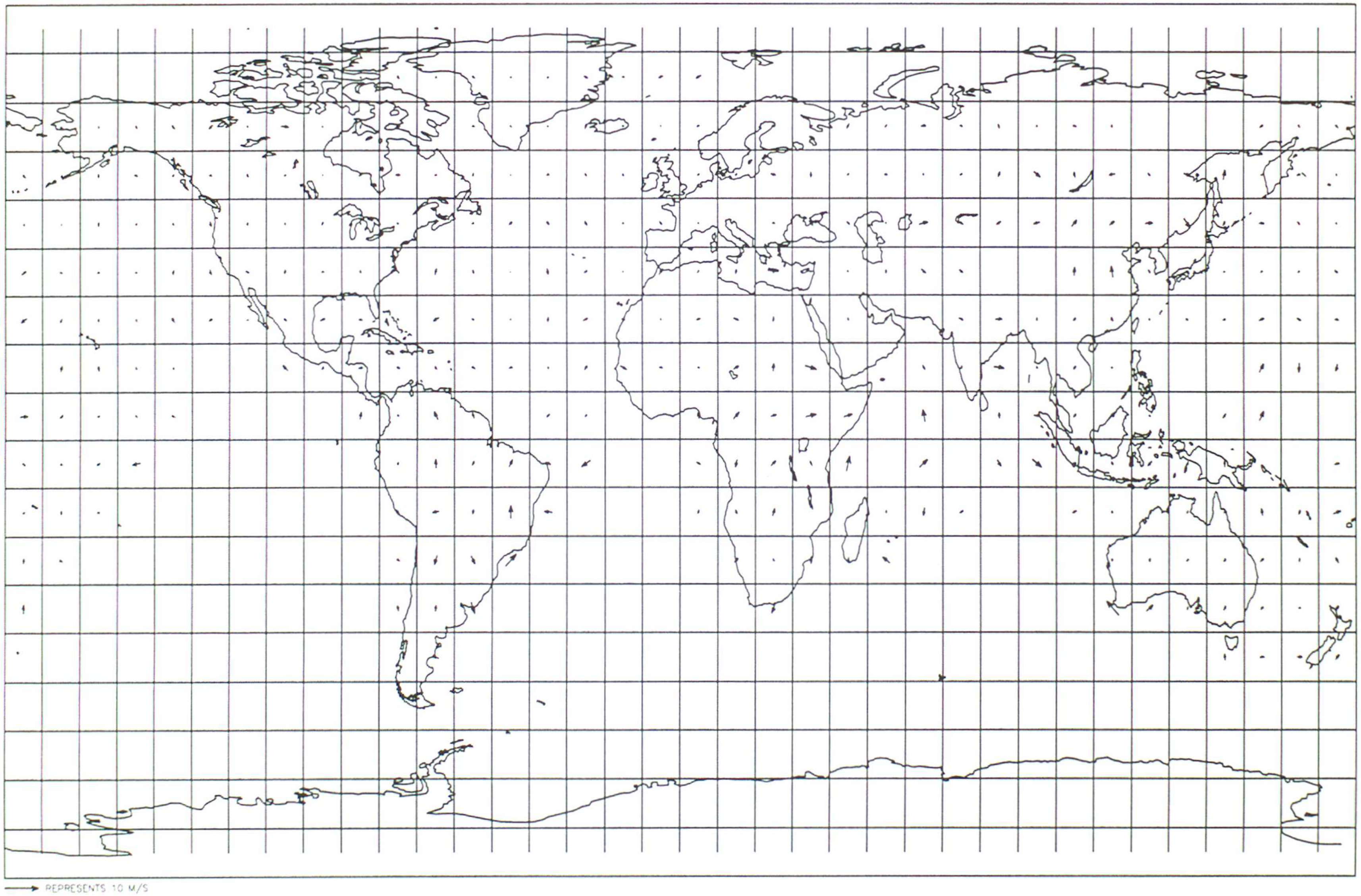
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 4

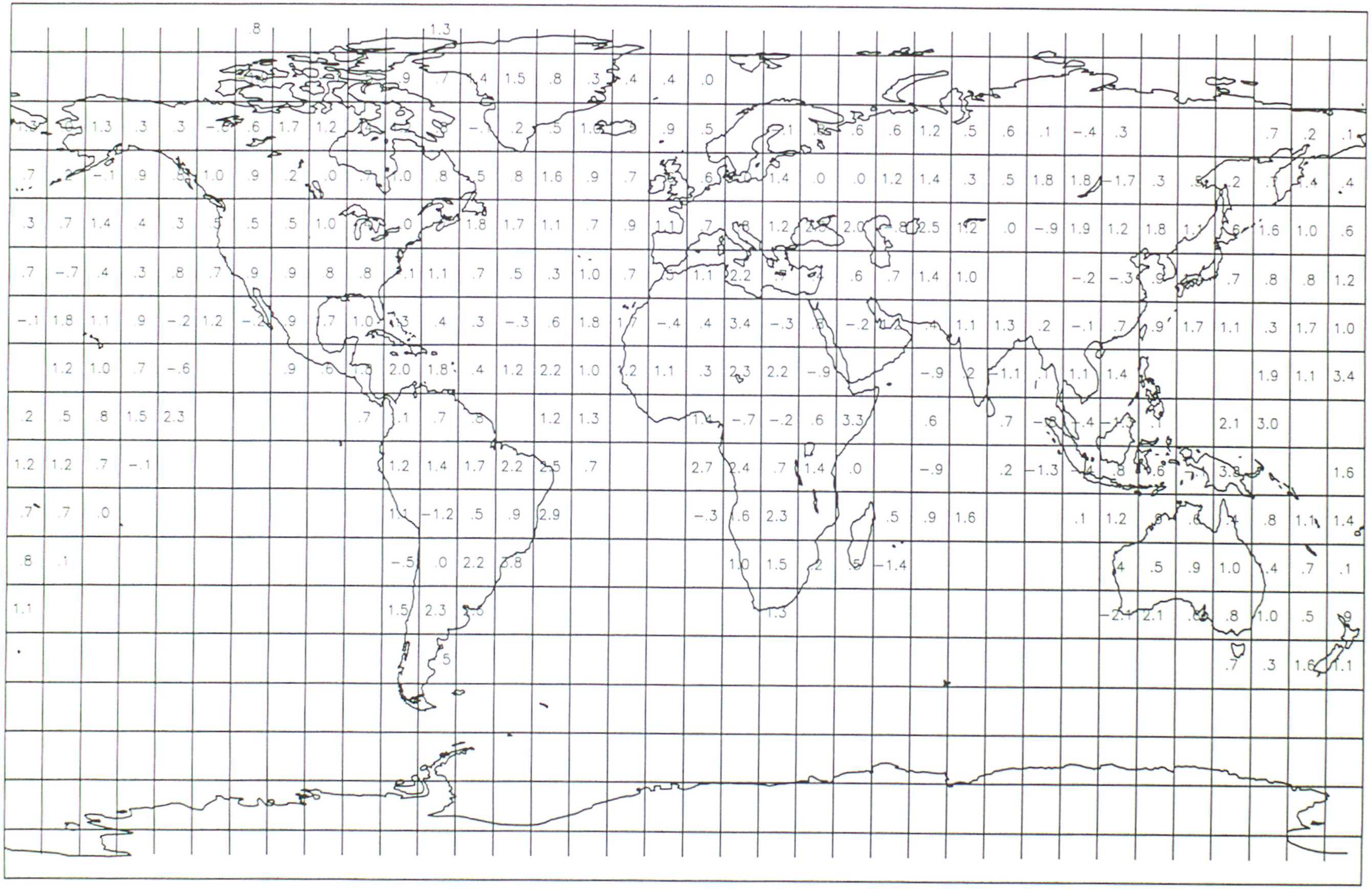


AIRCRAFT MEAN O–B WINDS BETWEEN 70 AND 500 HPA
OCTOBER 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 5



AIRCRAFT : MEAN O–B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
OCTOBER 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT



AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
OCTOBER 1998
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

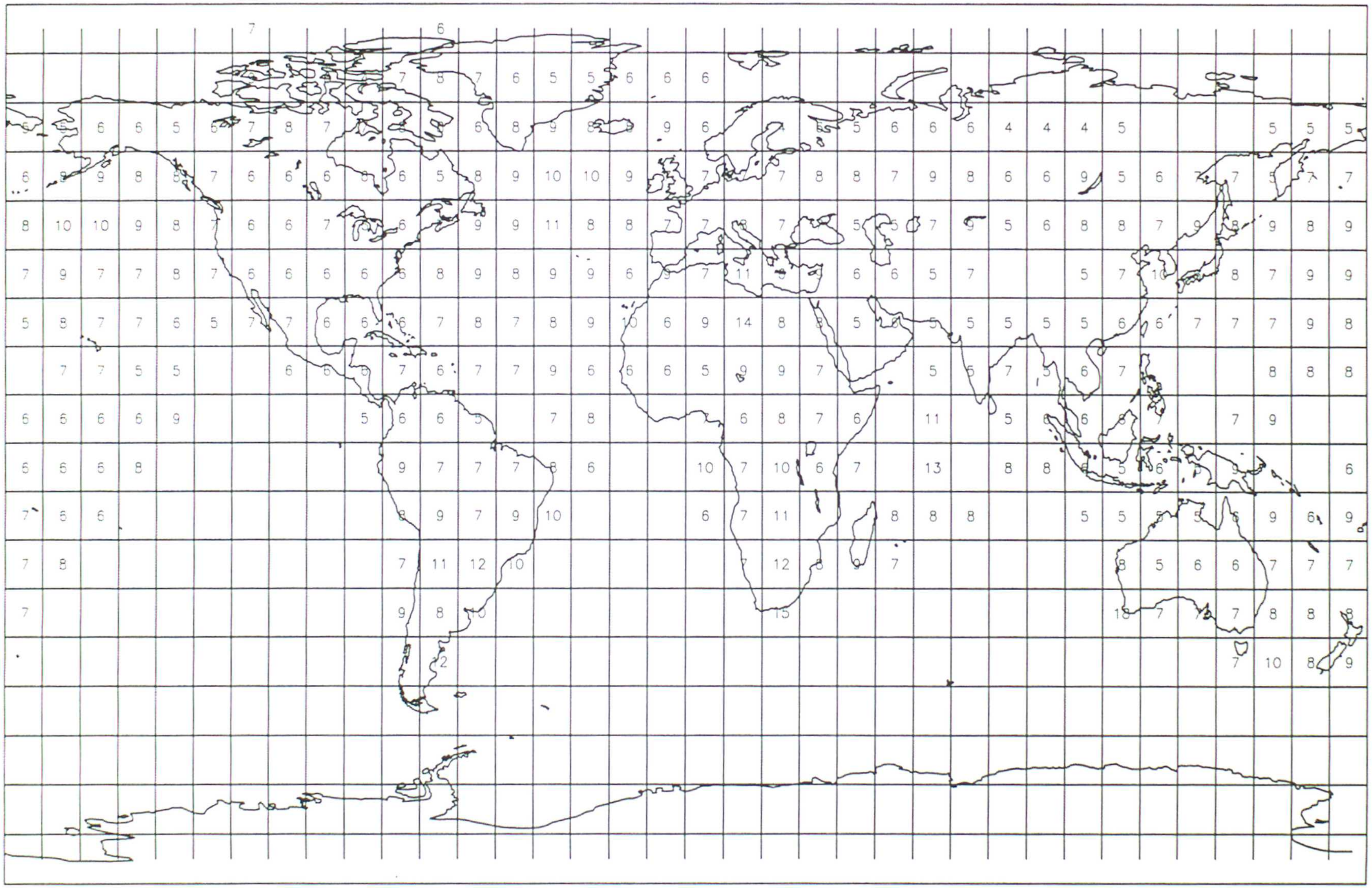


TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
33317	00	Z	200	50/ 27	12	0	41.7	80.1	90.3	4
33393	00	Z	150	50/ 24	11	0	38.2	124.5	130.2	4
33946	00	Z	100	45/ 34	20	1	34.4	122.7	127.4	4
34300	00	Z	100	50/ 36	12	0	26.5	109.1	112.2	4
41977	00	Z	200	22/ 92	17	0	54.3	-65.0	84.7	6
42027	00	Z	150	34/ 75	11	4	82.6	-193.5	210.3	7
42027	12	Z	1000	34/ 75	19	0	22.8	-45.4	50.8	5
42101	00	Z	200	30/ 76	22	1	61.3	-75.0	96.8	6
42182	12	Z	100	29/ 77	24	0	87.0	95.2	129.0	5
42339	12	Z	150	26/ 73	12	0	85.7	77.4	115.5	4
42369	00	Z	100	27/ 81	19	1	95.8	-108.0	144.4	4
42369	12	Z	200	27/ 81	18	0	88.9	9.0	89.4	4
42410	00	Z	100	26/ 92	21	0	111.2	96.3	147.1	4
42701	12	Z	100	23/ 85	16	1	122.2	46.2	130.6	4
42724	00	Z	250	24/ 91	18	0	57.4	56.0	80.2	5
43003	12	Z	200	19/ 73	22	1	76.7	92.3	120.0	6
43128	00	Z	100	17/ 78	27	1	103.2	-99.6	143.5	5
43185	12	Z	200	16/ 81	26	0	81.5	14.7	82.8	5
43192	00	Z	100	15/ 74	14	0	123.4	-50.2	133.2	5
43285	00	Z	100	13/ 75	22	1	107.3	-111.3	154.6	4
43311	00	Z	150	11/ 73	17	0	102.0	9.1	102.5	4
43311	12	Z	100	11/ 73	13	0	114.4	-43.9	122.6	6
43346	12	Z	400	11/ 80	25	0	49.9	26.5	56.5	6
43369	00	Z	100	8/ 73	14	2	82.8	-141.2	163.7	6
43371	12	Z	150	8/ 77	25	1	82.6	66.2	105.9	4
53463	00	Z	1000	41/ 112	28	0	13.2	41.3	43.3	5
53463	12	Z	200	41/ 112	22	2	74.9	56.1	93.6	5
57494	00	Z	200	31/ 114	28	0	20.5	73.1	76.0	4
65578	12	Z	200	5/ -4	27	0	29.6	77.7	83.2	8
72376	12	Z	1000	37/-108	25	0	29.8	17.6	34.6	5
84628	12	Z	850	-12/ -77	26	0	4.9	-73.5	73.7	8
89022	12	Z	400	-75/ -27	25	0	48.7	32.9	58.8	4
89512	00	Z	1000	-71/ 12	11	13	7.2	90.2	90.5	9
89512	12	Z	1000	-71/ 12	3	8	4.1	94.7	94.8	10
89664	00	Z	100	-78/ 167	16	0	56.9	157.8	167.7	7
89664	12	Z	200	-78/ 167	15	4	91.4	114.3	146.4	7
97180	00	Z	150	-5/ 120	20	0	125.7	-54.3	136.9	5

AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – OCTOBER 1998 FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1071

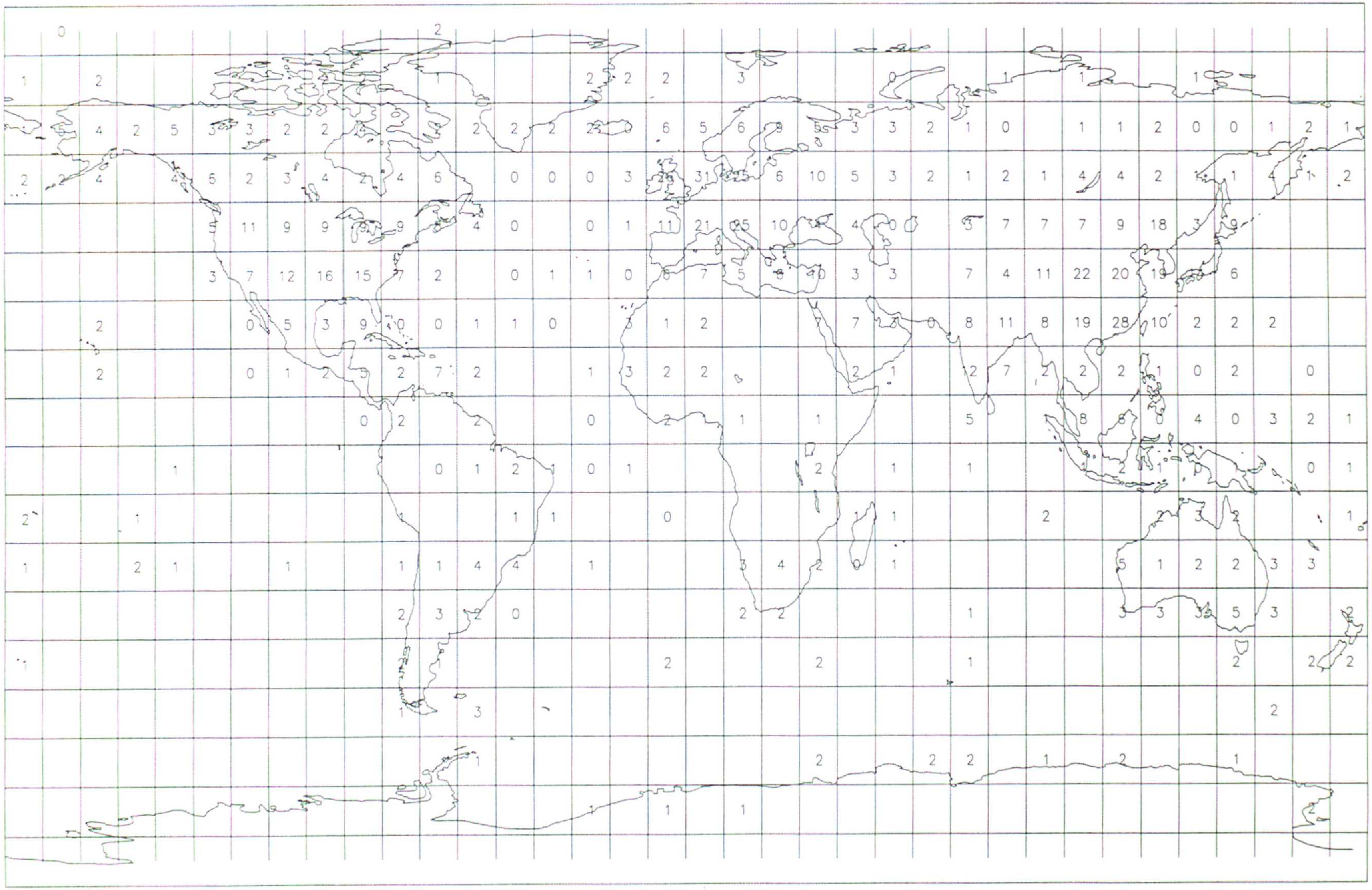


TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from Bracknell global model.
Observation times	:00 UTC and 12 UTC.
Level(s) monitored	:Standard levels between 1000.0 - 100.0 hPa
Element monitored	:VECTOR WIND in m s^{-1}

Parameters monitored

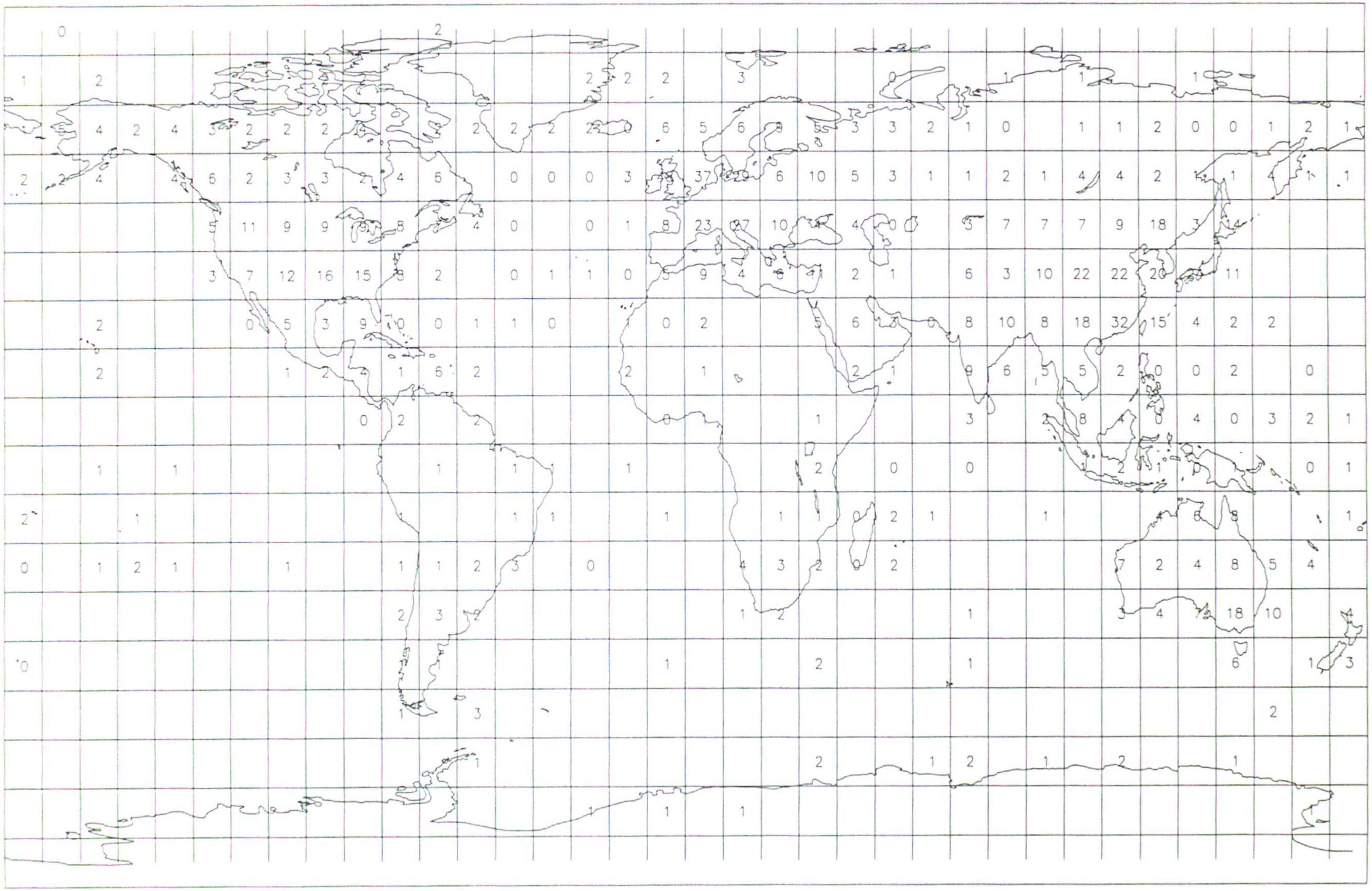
:NUM OBS	:Number of observations available at level shown during period.
:NUM GROSS	:Number of gross errors at level shown during period.
:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
:NUM LEVELS	:Number of levels satisfying selection criteria.

GROSS ERROR LIMITS	:Defined in Appendix I.2
SELECTION CRITERIA	: $\geq$ 10 observations and $\geq$ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
40754	00	V	300	36/ 51	12	0	8	6.4	2.3	16.2	1
62010	12	V	150	33/ 13	9	1	20	5.1	-3.7	16.5	1
78486	12	V	250	18/ -70	14	0	7	2.0	2.7	15.3	1
83612	12	V	200	-20/ -55	16	0	12	7.2	0.2	18.7	2

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – OCTOBER 1998 FIGURE 9
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1153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5 4 2 4 3 2 2 2 2 2 2 2 6 5 6 9 5 3 3 2 1 0 1 1 2 0 0 1 2 1
2 2 4 4 6 2 3 3 2 4 6 0 0 0 3 37 29 6 10 5 3 1 1 2 1 4 4 2 1 1 1 1
5 11 9 9 8 4 0 0 1 8 23 27 10 4 0 3 7 7 7 9 18 3 14
3 7 12 16 15 8 2 0 1 1 0 5 9 4 8 4 2 1 6 3 10 22 22 20 11
2 0 5 3 9 0 0 1 1 0 1 0 2 5 6 3 0 8 10 8 18 32 15 4 2 2
2 1 2 4 1 6 2 2 1 2 1 9 6 5 5 2 0 0 2 0
0 2 2 0 1 3 2 8 4 0 4 0 3 2 1
1 1 1 1 1 1 2 0 0 2 1 0 0 1
2 1 1 1 1 1 1 1 0 2 1 1 6 8 1
0 1 2 1 1 1 1 2 3 0 4 3 2 0 2 7 2 4 8 5 4
2 3 2 1 2 1 3 4 7 18 10 4
0 1 1 2 1 6 1 3
1 3 2
1 2 1 2 1 2 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
17280	12	DD	38/ 40	27	-10.8	8.1	14.1
42339	00	DD	26/ 73	16	16.2	9.4	19.4
42339	12	DD	26/ 73	12	17.5	9.8	17.0
42667	00	DD	23/ 77	8	11.8	8.5	22.7
42867	12	DD	21/ 79	10	14.3	7.8	27.4
44288	12	DD	46/ 103	13	-11.9	4.9	13.1
48568	00	DD	7/ 101	16	20.1	4.4	21.4
59134	00	DD	24/ 118	22	12.5	9.7	24.2
59431	12	DD	23/ 108	16	10.9	6.0	19.4
62337	00	DD	31/ 34	27	-22.1	3.1	11.2
62337	12	DD	31/ 34	24	-22.0	6.6	14.3
76644	12	DD	21/ -90	12	-13.5	7.6	21.7
78866	12	DD	18/ -63	13	-12.8	5.9	17.3
83612	00	DD	-20/ -55	13	11.3	6.9	17.4
97180	00	DD	-5/ 120	14	-10.8	8.6	26.4

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: October 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES, METEOSAT, GMS, INSAT.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

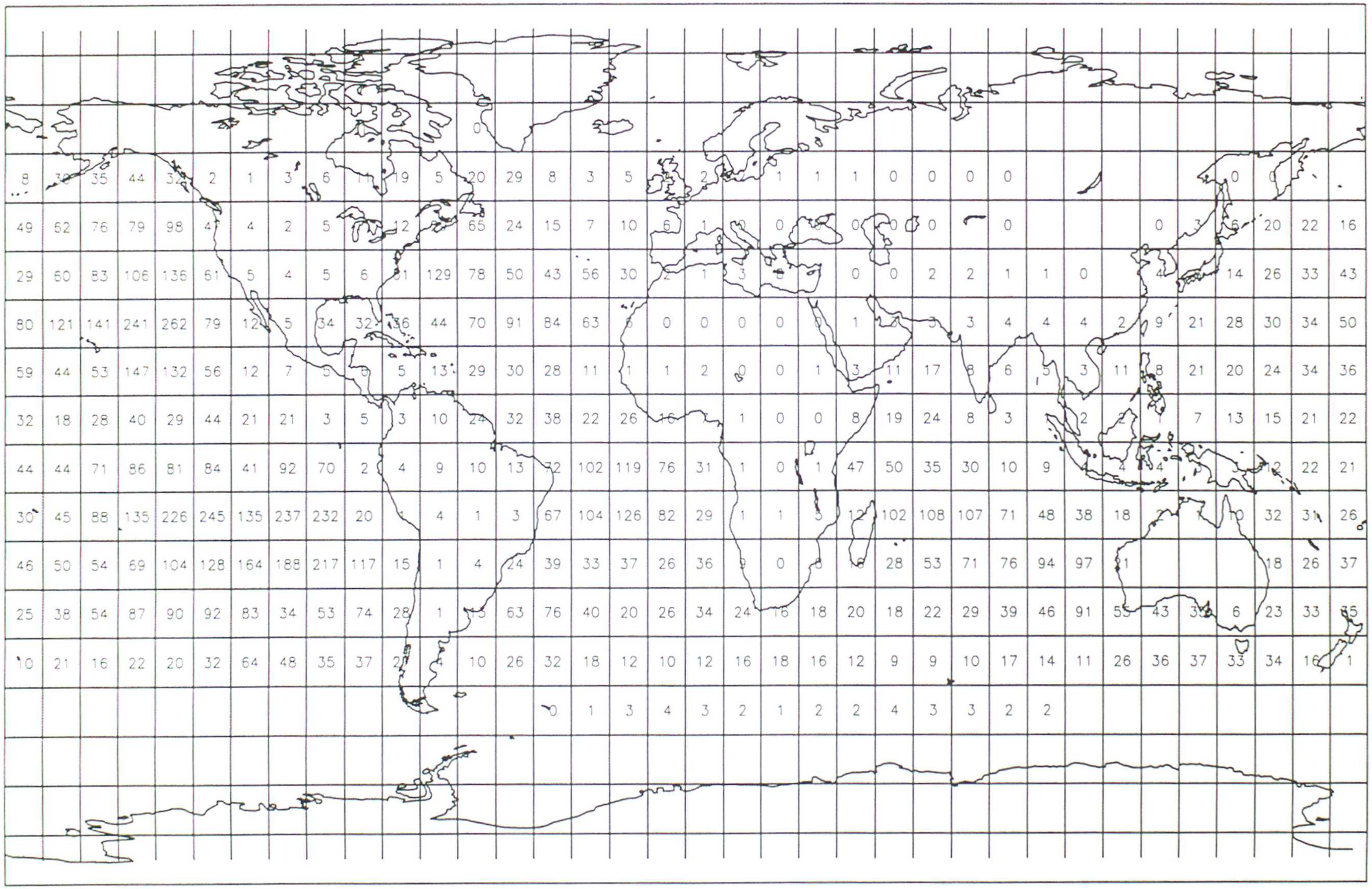
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
OCTOBER 1998



												0																							
8	30	35	44	32	2	1	3	6	11	19	5	20	29	8	3	5	[illegible]	2	2	1	1	1	0	0	0	0						0	0		
49	62	76	79	98	47	4	2	5		12	[illegible]	65	24	15	7	10	6	1	0	0	0	0	0	0		0				0	3	6	20	22	16
29	60	83	106	136	61	5	4	5	6	31	129	78	50	43	56	30	2	1	3	[illegible]		0	0	2	2	1	1	0		4	[illegible]	14	26	33	43
80	121	141	241	262	79	12	5	34	32	36	44	70	91	84	63	6	0	0	0	0	0	1	3	3	3	4	4	4	2	9	21	28	30	34	50
59	44	53	147	132	56	12	7	5	6	5	13	29	30	28	11	1	1	2	0	0	1	3	11	17	8	6	5	3	11	8	21	20	24	34	36
32	18	28	40	29	44	21	21	3	5	3	10	24	32	38	22	26	16	7	1	0	0	8	19	24	8	3	[illegible]	2	2	1	7	13	15	21	22
44	44	71	86	81	84	41	92	70	2	4	9	10	13	72	102	119	76	31	1	0	1	47	50	35	30	10	9	4	4	4	[illegible]	[illegible]	12	22	21
30	45	88	135	226	245	135	237	232	20	[illegible]	4	1	3	67	104	126	82	29	1	1	3	12	102	108	107	71	48	38	18	2	1	10	32	31	26
46	50	54	69	104	128	164	188	217	117	15	1	4	24	39	33	37	26	36	9	0	8	16	28	53	71	76	94	97	21				18	26	37
25	38	54	87	90	92	83	34	53	74	28	1	15	63	76	40	20	26	34	24	16	18	20	18	22	29	39	46	91	55	43	33	6	23	33	35
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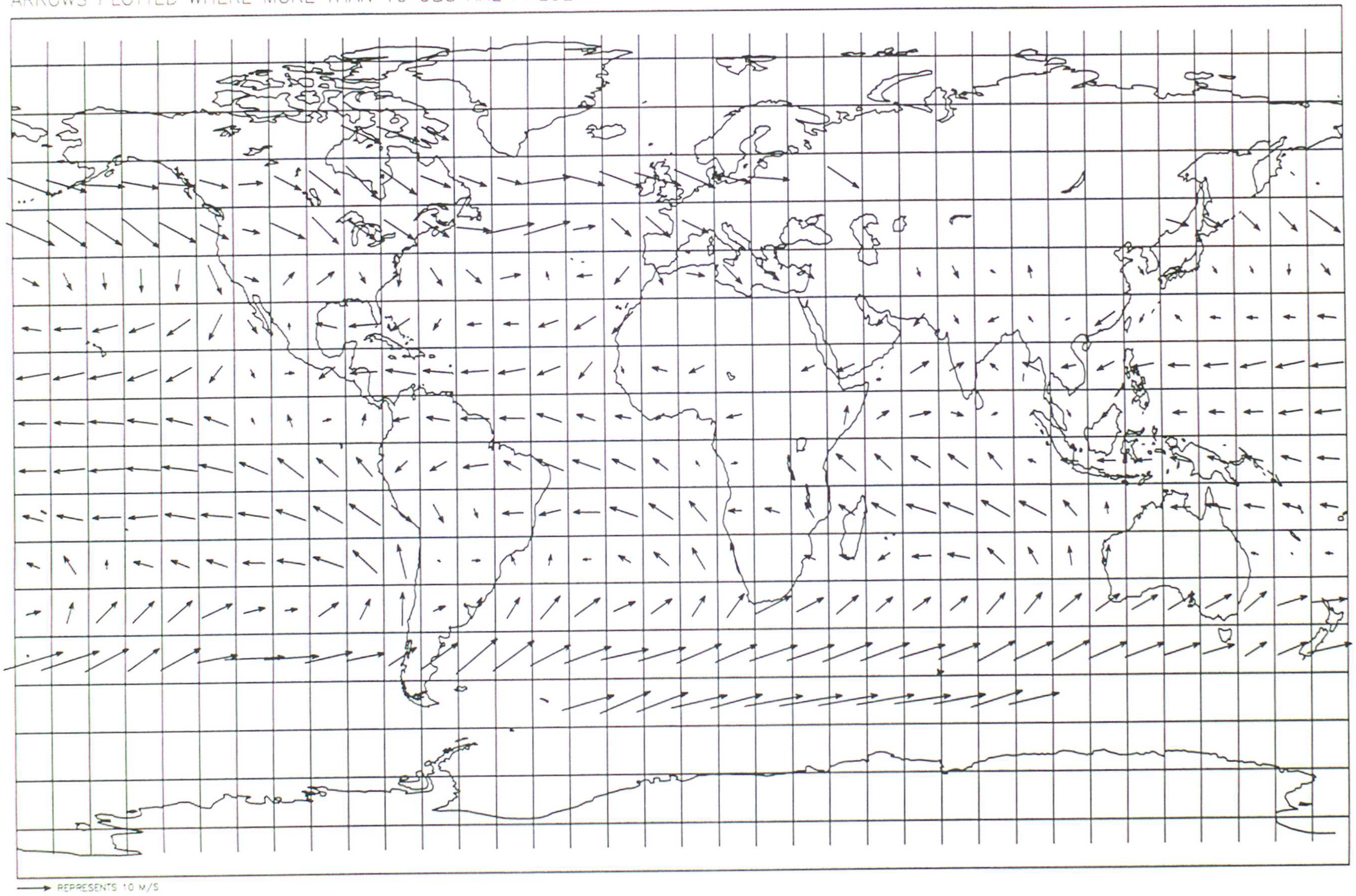
														0	1	3	4	3	2	1	2	2	4	3	3	2	2								

FIGURE 11

SATOB VECTOR MEAN WINDS BETWEEN 701–1000 HPA
OCTOBER 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 10 M/S

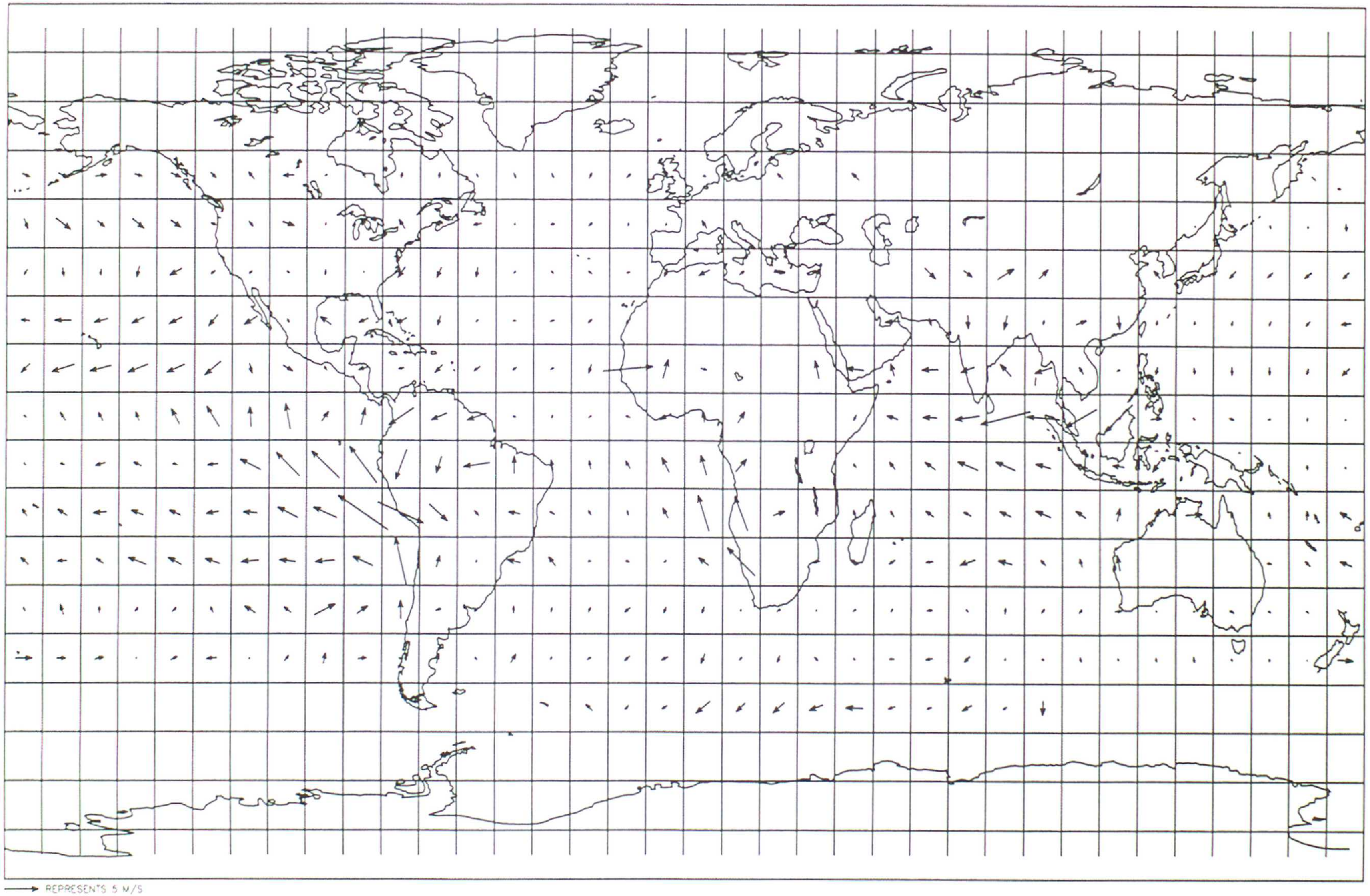
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA

FIGURE 12

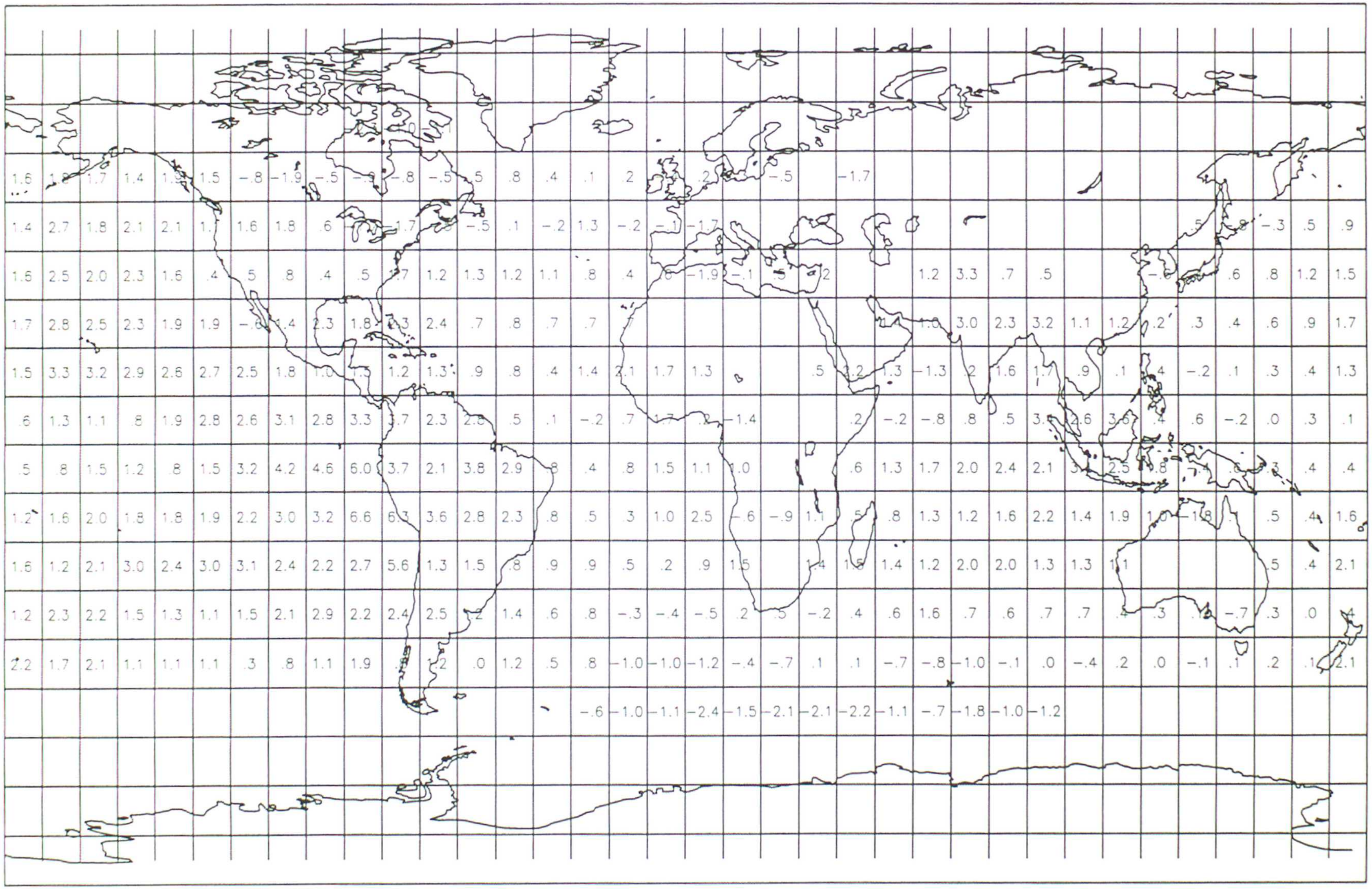
OCTOBER 1998

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT



SATOBS : MEAN O−B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
OCTOBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT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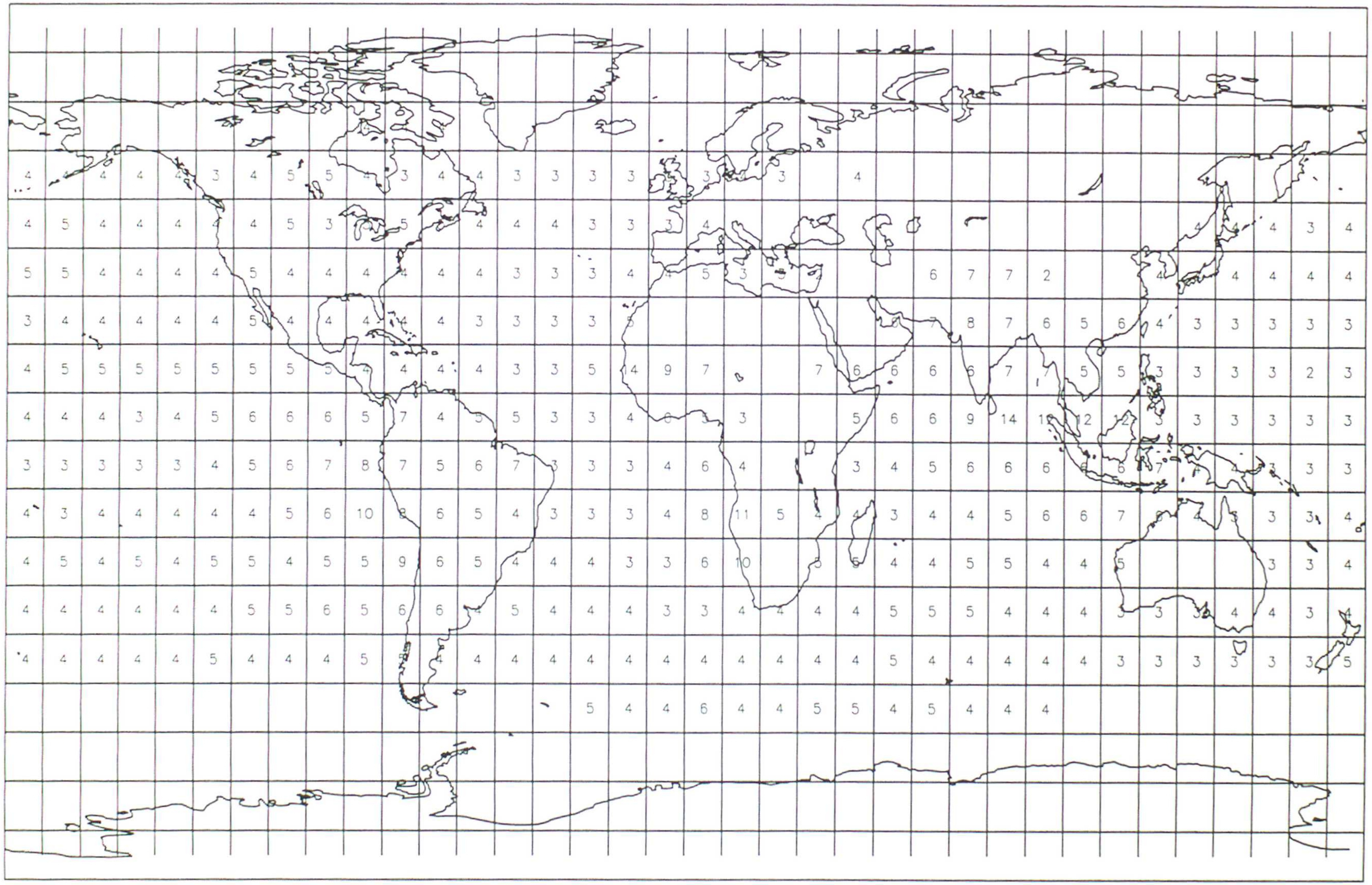
1.6 1.8 1.7 1.4 1.9 1.5 −.8 −1.9 −.5 −.9 −.8 −.5 .5 .8 .4 .1 .2 −.1 .2 −.5 −1.7
1.4 2.7 1.8 2.1 2.1 1.1 1.6 1.8 .6 −.7 −1.7 −.8 −.5 .1 −.2 1.3 −.2 −.1 −1.7 .5 −.8 −.3 .5 .9
1.6 2.5 2.0 2.3 1.6 .4 .5 .8 .4 .5 1.7 1.2 1.3 1.2 1.1 .8 .4 .6 −1.9 −.1 .5 .2 1.2 3.3 .7 .5 −.6 .6 .8 1.2 1.5
1.7 2.8 2.5 2.3 1.9 1.9 −.6 1.4 2.3 1.8 2.3 2.4 .7 .8 .7 .7 .7 1.4 1.0 3.0 2.3 3.2 1.1 1.2 .2 .3 .4 .6 .9 1.7
1.5 3.3 3.2 2.9 2.6 2.7 2.5 1.8 1.0 1.5 1.2 1.3 .9 .8 .4 1.4 2.1 1.7 1.3 .5 3.2 1.3 −1.3 .2 1.6 1.7 .9 .1 .4 −.2 .1 .3 .4 1.3
.6 1.3 1.1 .8 1.9 2.8 2.6 3.1 2.8 3.3 3.7 2.3 2.8 .5 .1 −.2 .7 1.7 .2 −1.4 .2 −.2 −.8 .8 .5 3.5 2.6 3.6 .4 .6 −.2 .0 .3 .1
.5 .8 1.5 1.2 .8 1.5 3.2 4.2 4.6 6.0 3.7 2.1 3.8 2.9 .8 .4 .8 1.5 1.1 1.0 .6 1.3 1.7 2.0 2.4 2.1 3.4 2.5 .8 .4 .6 .3 .4 .4
1.2 1.6 2.0 1.8 1.8 1.9 2.2 3.0 3.2 6.6 6.3 3.6 2.8 2.3 .8 .5 .3 1.0 2.5 −.6 −.9 1.1 .5 .8 1.3 1.2 1.6 2.2 1.4 1.9 1.0 −1.8 .1 .5 .4 1.6
1.6 1.2 2.1 3.0 2.4 3.0 3.1 2.4 2.2 2.7 5.6 1.3 1.5 .8 .9 .9 .5 .2 .9 1.5 1.4 1.5 1.4 1.2 2.0 2.0 1.3 1.3 1.1 .5 .4 2.1
1.2 2.3 2.2 1.5 1.3 1.1 1.5 2.1 2.9 2.2 2.4 2.5 .2 1.4 .6 .8 −.3 −.4 −.5 .2 .5 −.2 .4 .6 1.6 .7 .6 .7 .7 .4 .3 .1 −.7 .3 .0 .4
2.2 1.7 2.1 1.1 1.1 1.1 .3 .8 1.1 1.9 .8 1.2 .0 1.2 .5 .8 −1.0 −1.0 −1.2 −.4 −.7 .1 .1 −.7 −.8 −1.0 −.1 .0 −.4 .2 .0 −.1 .1 .2 .1 2.1
−.6 −1.0 −1.1 −2.4 −1.5 −2.1 −2.1 −2.2 −1.1 −.7 −1.8 −1.0 −1.2

SATOBS : RMS O–B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
OCTOBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT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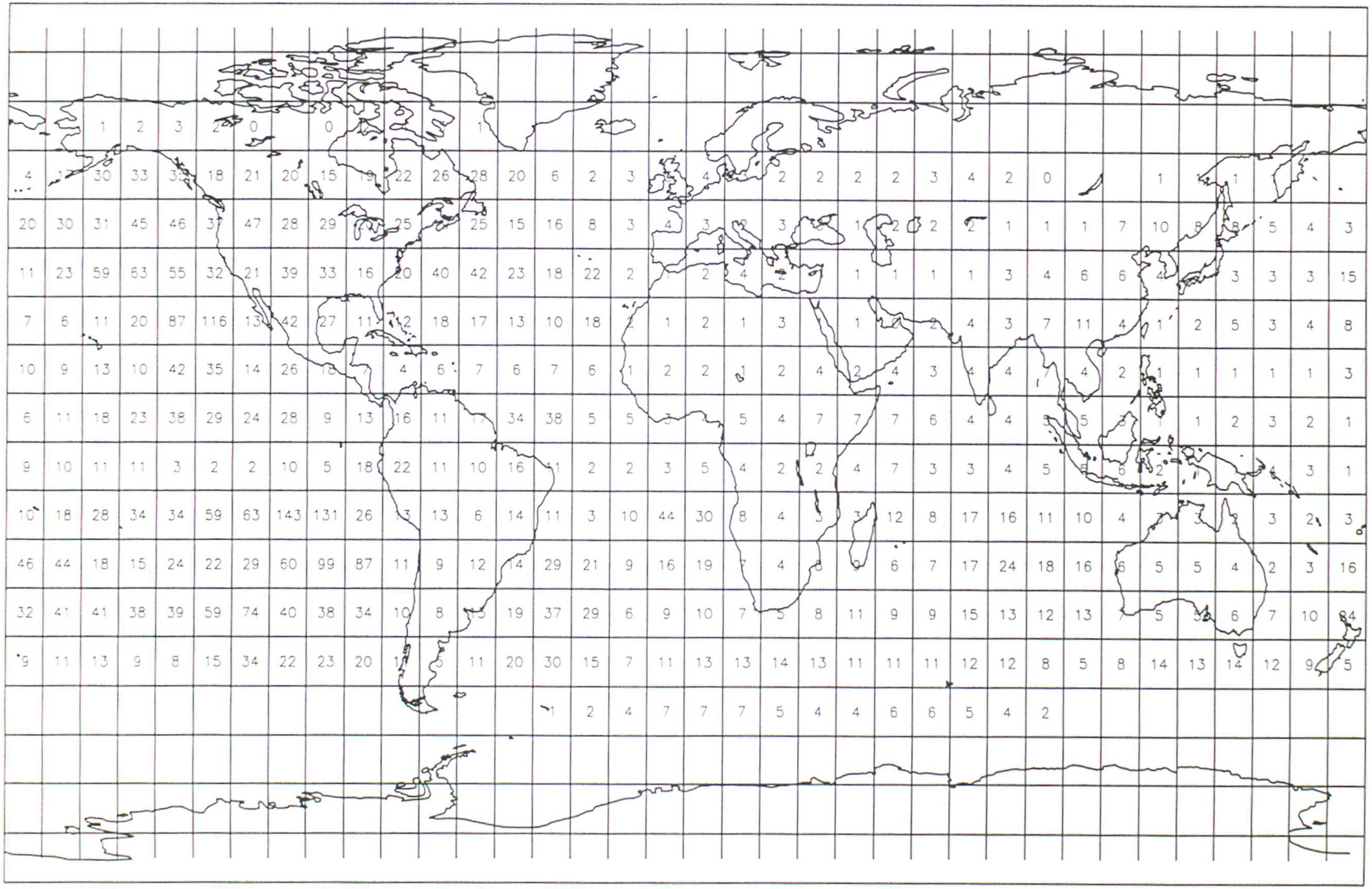
4 5 4 4 4 4 4 5 3 5 4 4 4 3 3 3 4 4 4 4 3 4
5 5 4 4 4 4 5 4 4 4 4 4 4 3 3 3 4 4 5 3 3 6 7 7 2 4 4 4 4 4
3 4 4 4 4 4 5 4 4 4 4 4 3 3 3 3 5 8 7 8 7 6 5 6 4 3 3 3 3 3
4 5 5 5 5 5 5 5 5 4 4 4 4 3 3 5 14 9 7 7 6 6 6 6 7 7 5 5 3 3 3 3 2 3
4 4 4 3 4 5 6 6 6 5 7 4 5 5 3 3 4 6 3 3 5 6 6 9 14 10 12 12 3 3 3 3 3 3
3 3 3 3 3 4 5 6 7 8 7 5 6 7 3 3 3 4 6 4 3 4 5 6 6 6 6 6 7 4 4 3 3 3
4 3 4 4 4 4 4 5 6 10 8 6 5 4 3 3 3 4 8 11 5 4 4 3 4 4 5 6 6 7 8 4 3 3 3 4
4 5 4 5 4 5 5 4 5 5 9 6 5 4 4 4 3 3 6 10 5 5 4 4 5 5 4 4 5 3 3 4
4 4 4 4 4 4 5 5 6 5 6 6 4 5 4 4 4 3 3 4 4 4 4 5 5 5 4 4 4 3 3 3 4 4 3 4
4 4 4 4 4 5 4 4 4 5 5 4 4 4 4 4 4 4 4 4 4 4 4 5 4 4 4 4 4 3 3 3 3 3 3 5
5 4 4 6 4 4 5 5 4 5 4 4 4

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
OCTOBER 1998


1 2 3 2 0 0 1
4 1 30 33 33 18 21 20 15 19 22 26 28 20 6 2 3 4 2 2 2 2 3 4 2 0 1 1 1
20 30 31 45 46 37 47 28 29 25 25 15 16 8 3 4 3 3 1 2 2 2 1 1 1 7 10 8 8 5 4 3
11 23 59 63 55 32 21 39 33 16 20 40 42 23 18 22 2 2 4 2 1 1 1 1 3 4 6 6 4 3 3 3 15
7 6 11 20 87 116 13 42 27 11 12 18 17 13 10 18 2 1 2 1 3 1 2 4 3 7 11 4 1 2 5 3 4 8
10 9 13 10 42 35 14 26 4 6 7 6 7 6 1 2 2 1 2 4 2 4 3 4 4 4 2 1 1 1 1 1 3
6 11 18 23 38 29 24 28 9 13 16 11 34 38 5 5 5 4 7 7 7 6 4 4 5 1 2 3 2 1
9 10 11 11 3 2 2 10 5 18 22 11 10 16 1 2 2 3 5 4 2 2 4 7 3 3 4 5 6 2 3 1
10 18 28 34 34 59 63 143 131 26 13 6 14 11 3 10 44 30 8 4 3 12 8 17 16 11 10 4 3 3 2 3
46 44 18 15 24 22 29 60 99 87 11 9 12 14 29 21 9 16 19 7 4 6 7 17 24 18 16 6 5 5 4 2 3 16
32 41 41 38 39 59 74 40 38 34 10 8 19 37 29 6 9 10 7 8 11 9 9 15 13 12 13 5 6 7 10 84
9 11 13 9 8 15 34 22 23 20 11 20 30 15 7 11 13 13 14 13 11 11 11 12 12 8 5 8 14 13 14 12 9 5
1 2 4 7 7 7 5 4 4 6 6 5 4 2

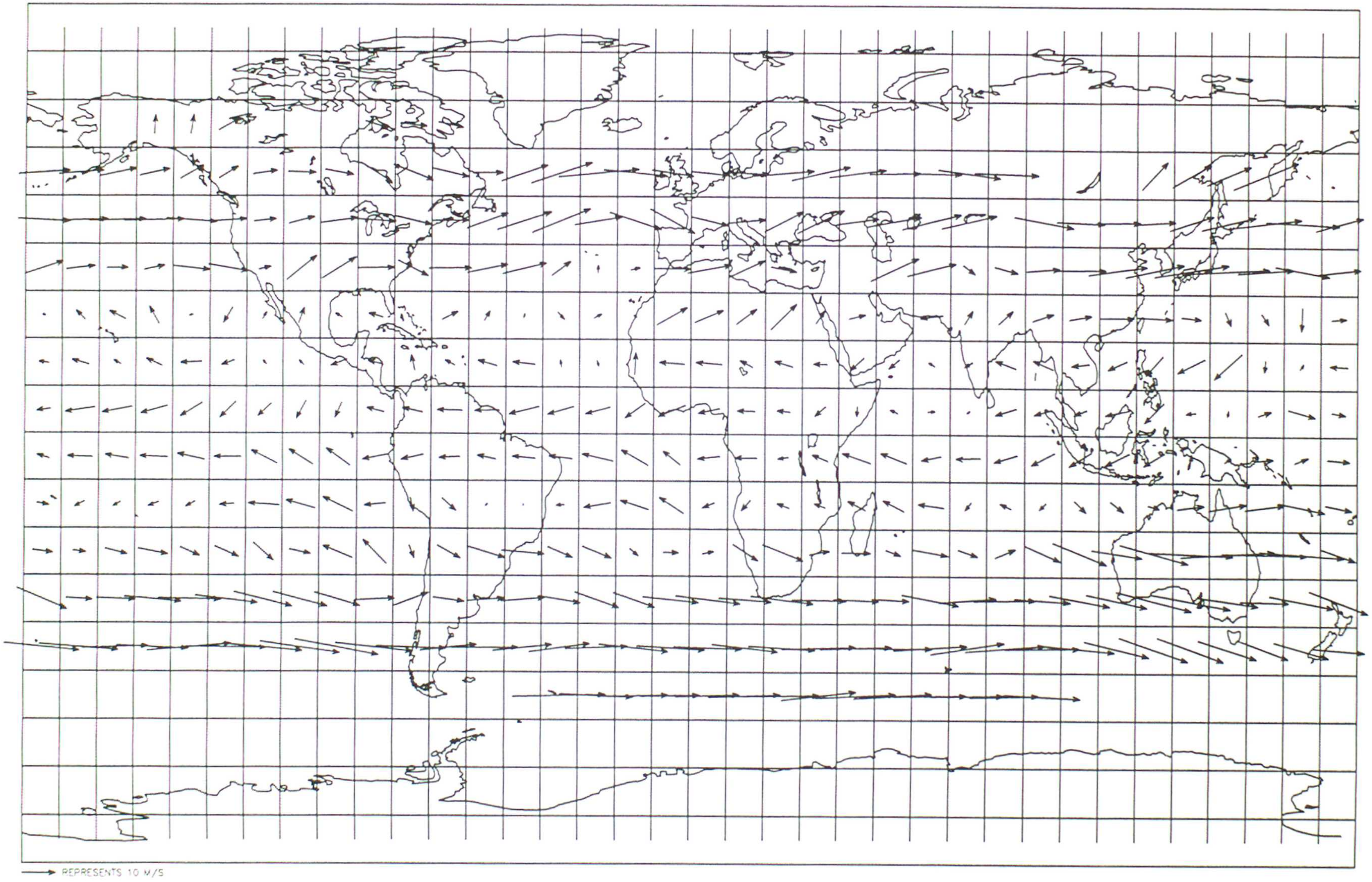
SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA

OCTOBER 1998

ALL OBSERVATIONS

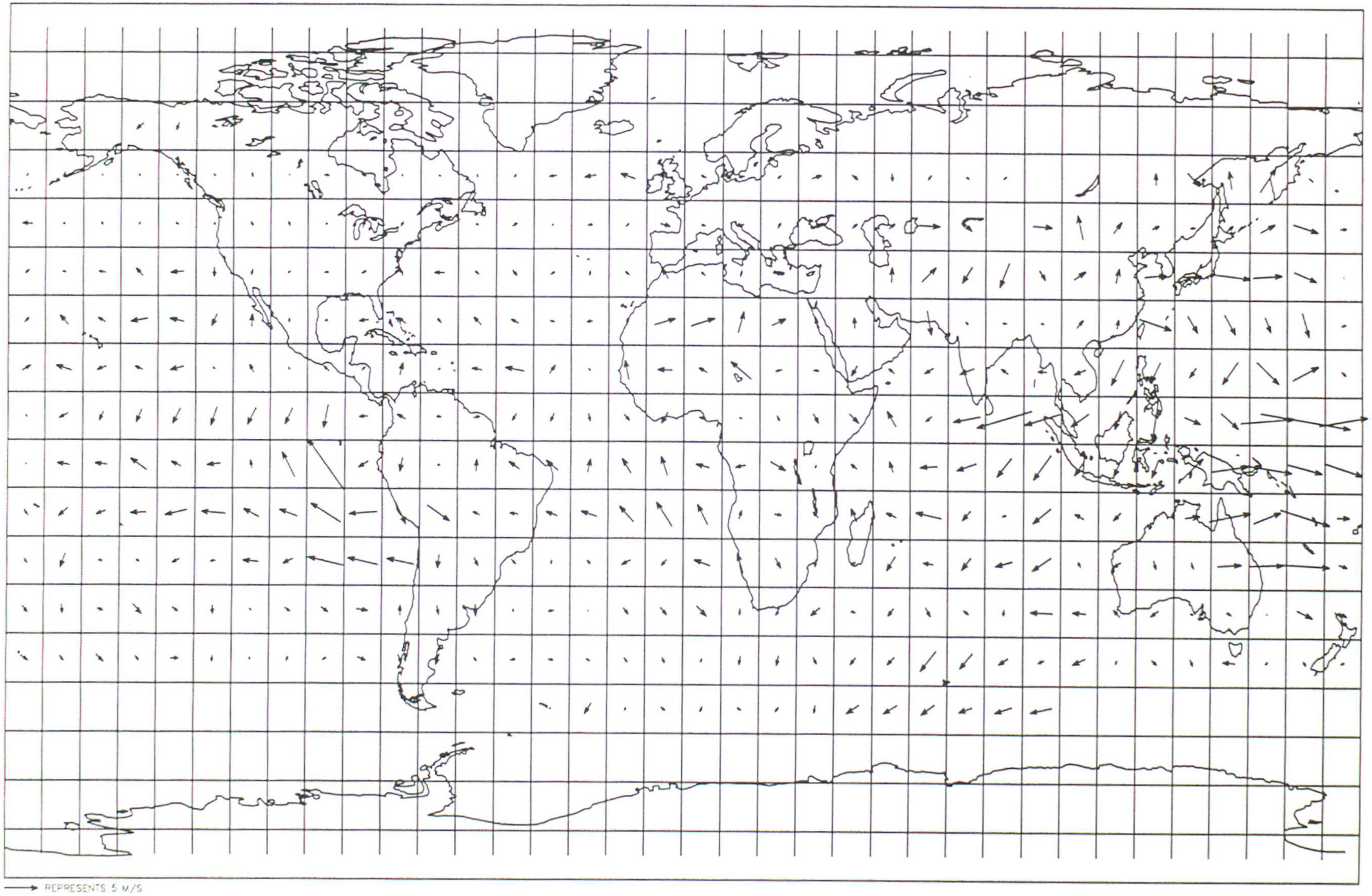
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16

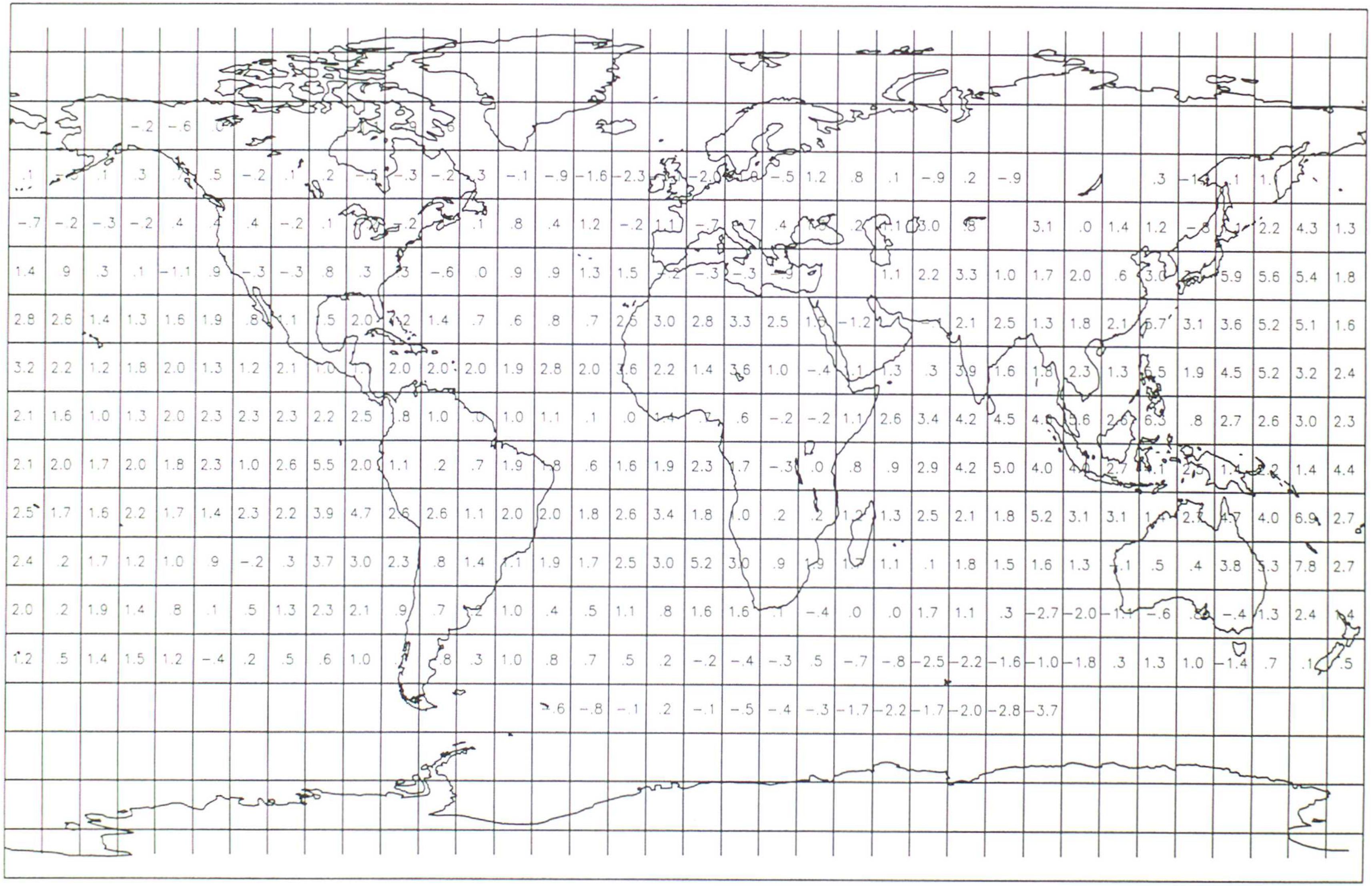

→ REPRESENTS 10 M/S

SATOB O–B VECTOR WIND DIFFERENCES BETWEEN 401–700 HPA
OCTOBER 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 17



SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
OCTOBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

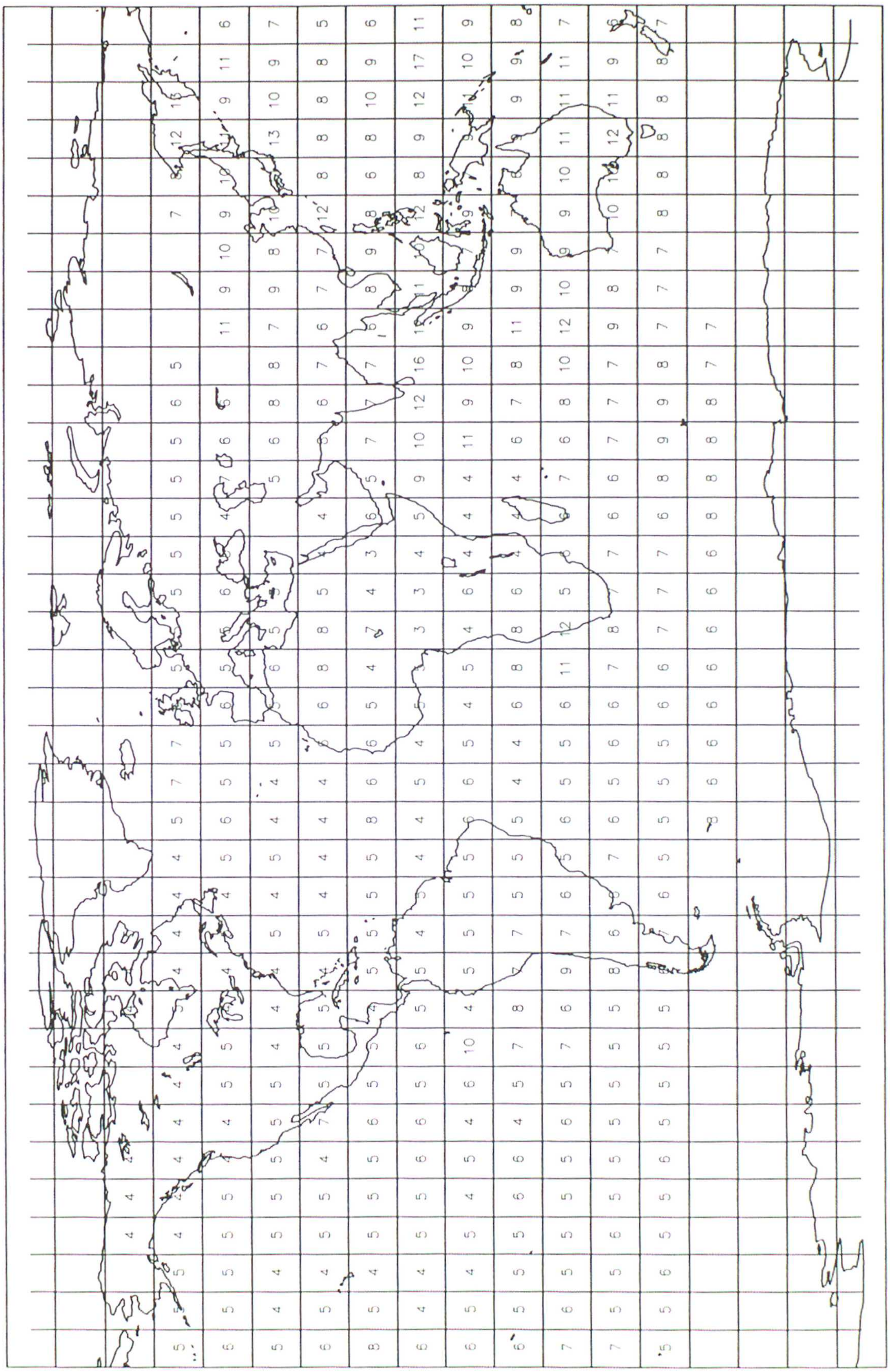


SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19

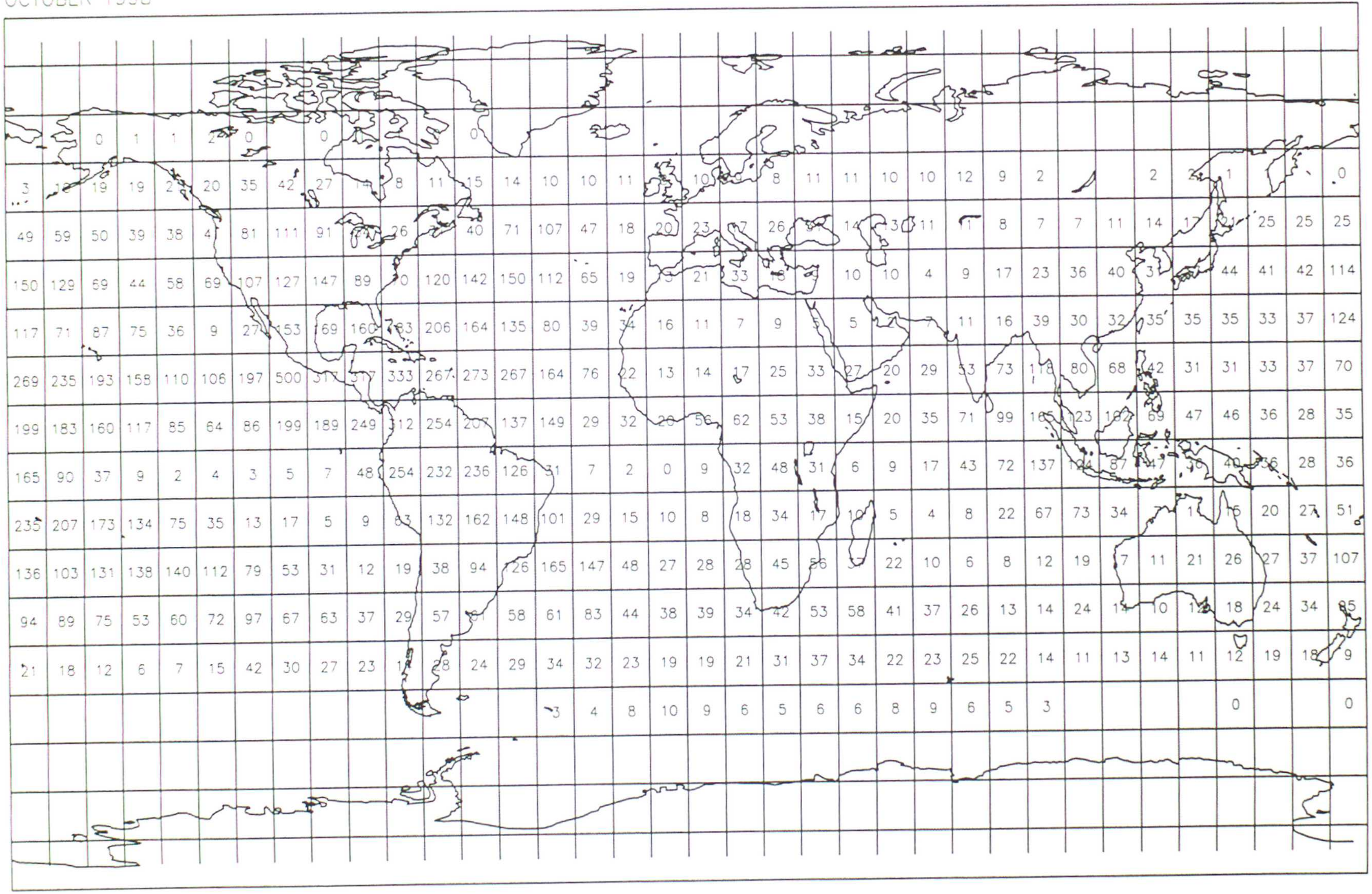
OCTOBER 1998

USING ALL OBSERVATIONS

VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
OCTOBER 1998


0 1 1 2 0 0 0
3 19 19 19 21 20 35 42 27 14 8 11 15 14 10 10 11 10 9 8 11 11 10 10 12 9 2 2 2 1 0
49 59 50 39 38 4 81 111 91 74 26 40 71 107 47 18 20 23 17 26 31 14 13 11 11 8 7 7 11 14 17 21 25 25 25
150 129 69 44 58 69 107 127 147 89 70 120 142 150 112 65 19 13 21 33 18 9 10 10 4 9 17 23 36 40 31 44 41 42 114
117 71 87 75 36 9 27 153 169 160 183 206 164 135 80 39 34 16 11 7 9 5 5 2 7 11 16 39 30 32 35 35 35 33 37 124
269 235 193 158 110 106 197 500 317 317 333 267 273 267 164 76 22 13 14 17 25 33 27 20 29 53 73 118 80 68 42 31 31 33 37 70
199 183 160 117 85 64 86 199 189 249 312 254 207 137 149 29 32 26 56 62 53 38 15 20 35 71 99 165 123 182 69 47 46 36 28 35
165 90 37 9 2 4 3 5 7 48 254 232 236 126 31 7 2 0 9 32 48 31 6 9 17 43 72 137 124 87 47 36 40 36 28 36
235 207 173 134 75 35 13 17 5 9 63 132 162 148 101 29 15 10 8 18 34 17 10 5 4 8 22 67 73 34 7 1 15 20 27 51
136 103 131 138 140 112 79 53 31 12 19 38 94 126 165 147 48 27 28 28 45 56 37 22 10 6 8 12 19 7 11 21 26 27 37 107
94 89 75 53 60 72 97 67 63 37 29 57 61 58 61 83 44 38 39 34 42 53 58 41 37 26 13 14 24 14 10 12 18 24 34 85
21 18 12 6 7 15 42 30 27 23 14 28 24 29 34 32 23 19 19 21 31 37 34 22 23 25 22 14 11 13 14 11 12 19 18 9
3 4 8 10 9 6 5 6 6 8 9 6 5 3 0 0

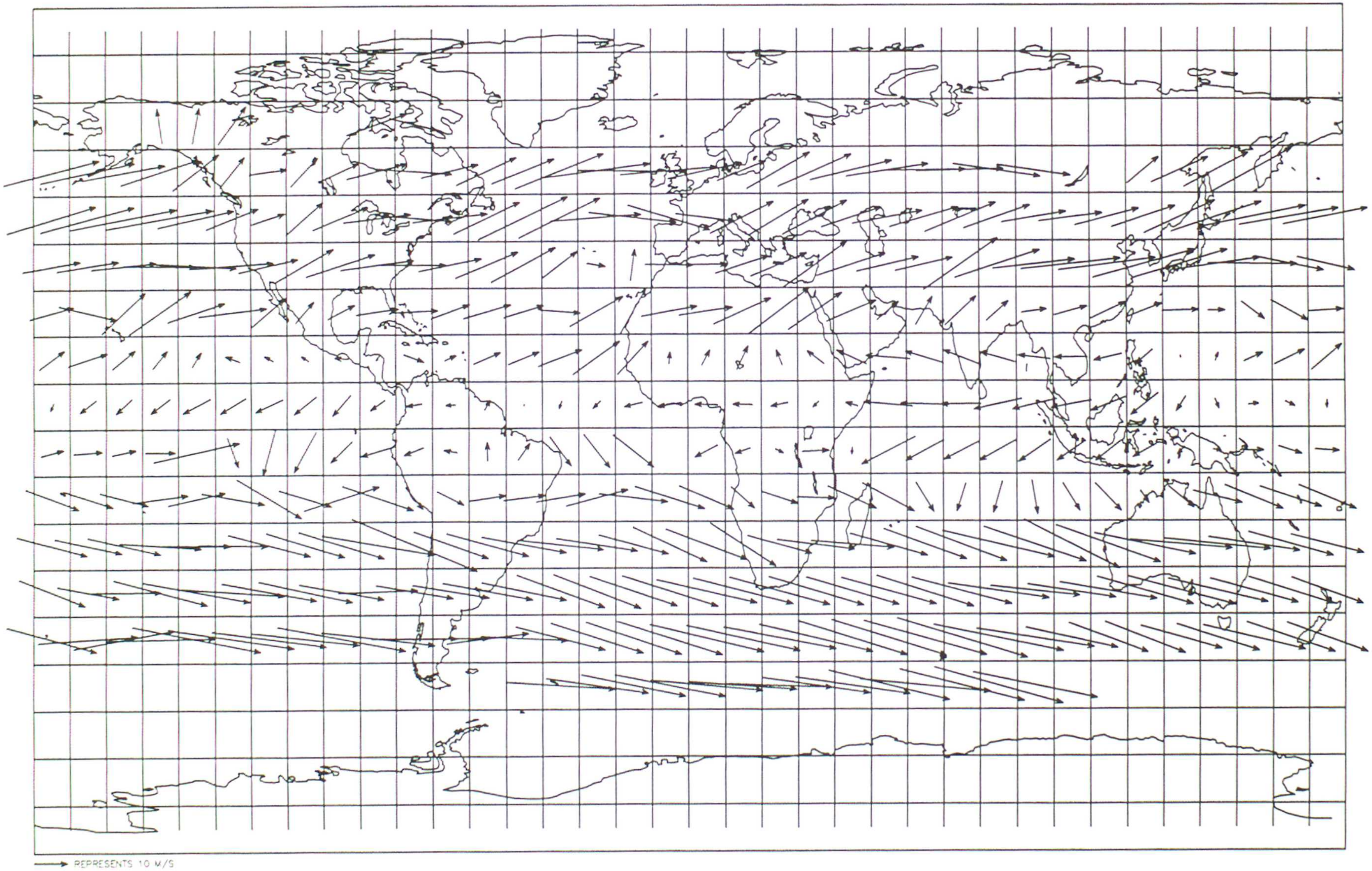
SATOB VECTOR MEAN WINDS BETWEEN 101–400 HPA

OCTOBER 1998

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 21


REPRESENTS 10 M/S

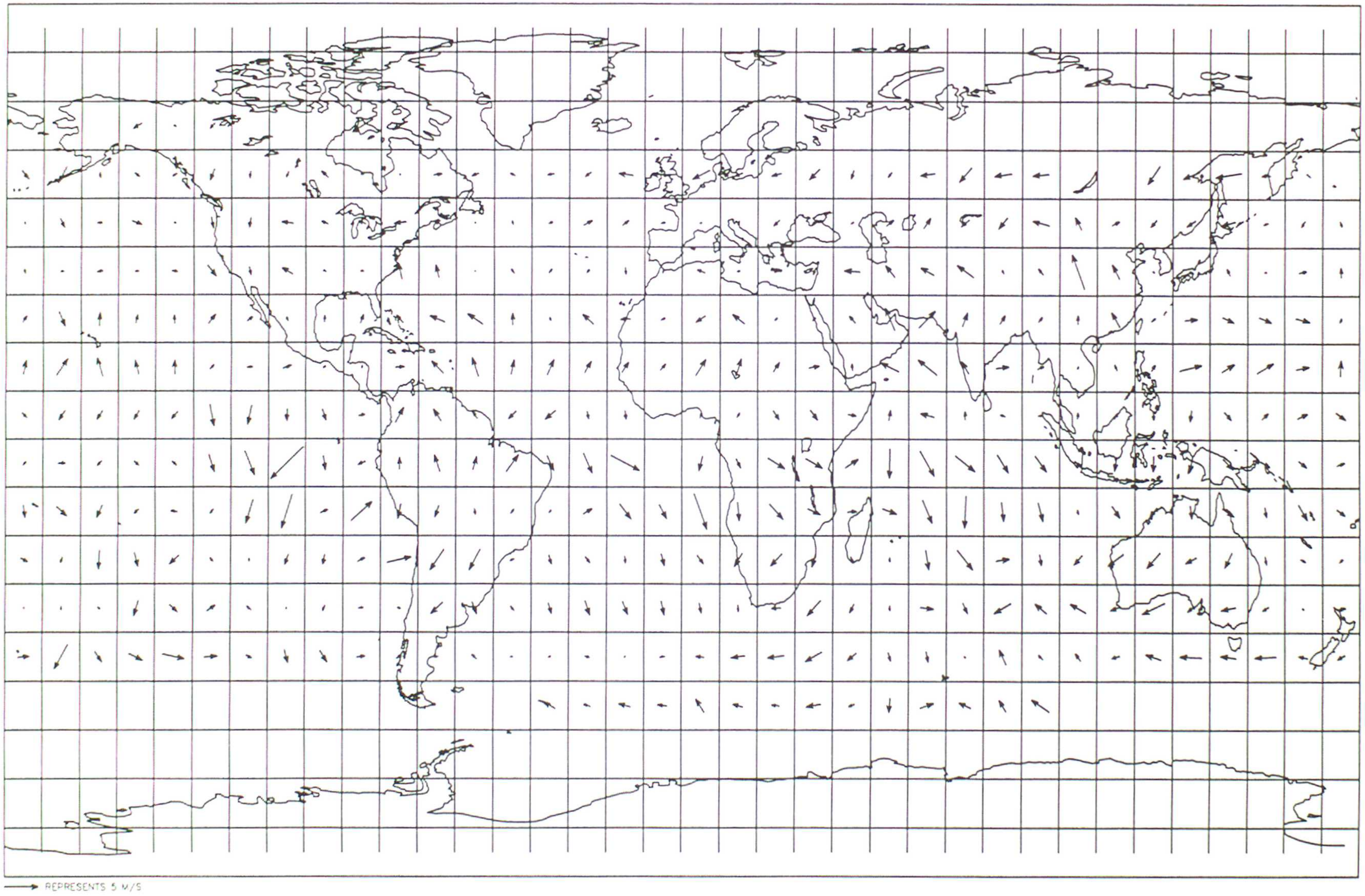
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA

OCTOBER 1998

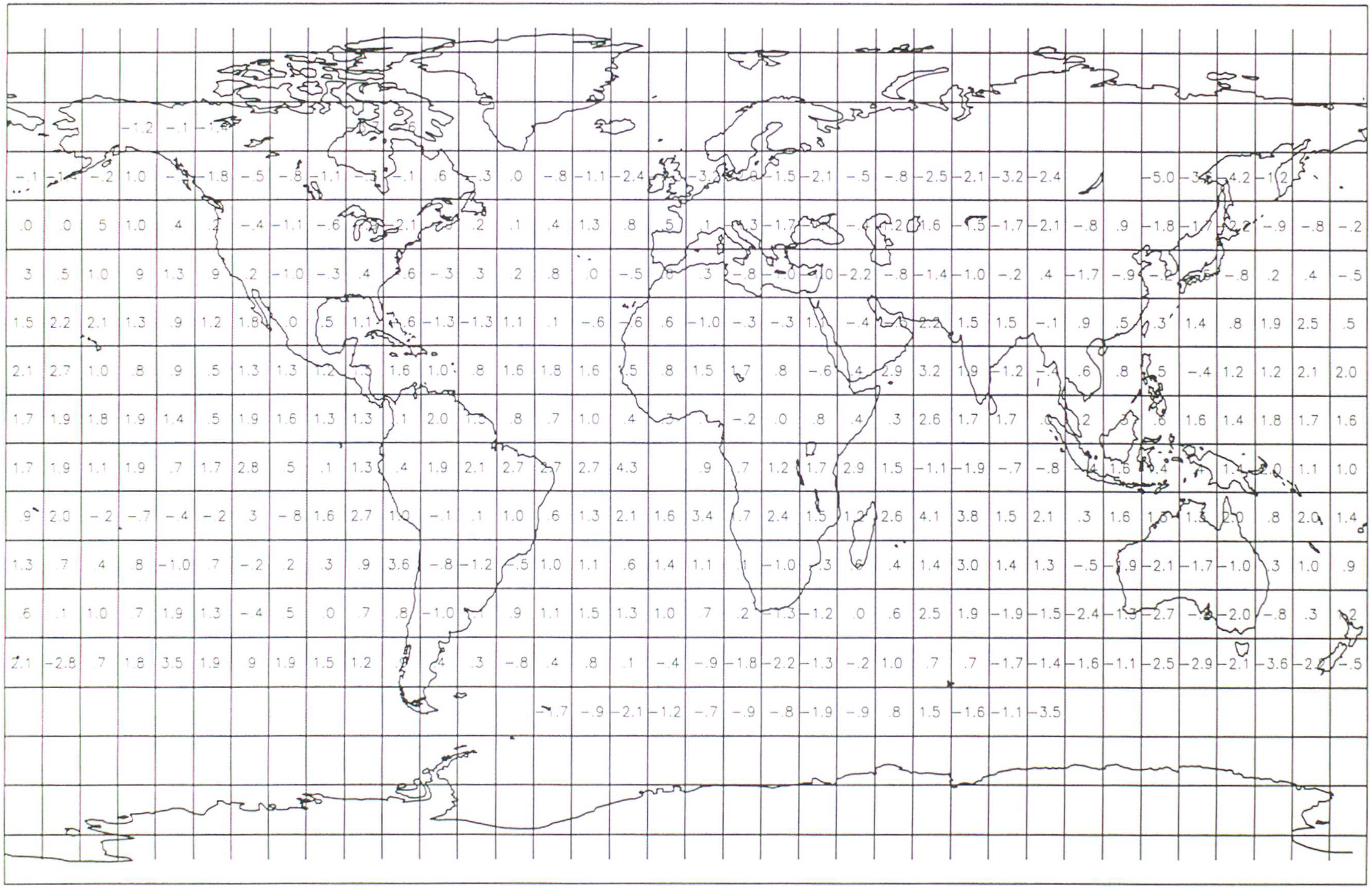
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 22



SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
OCTOBER 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

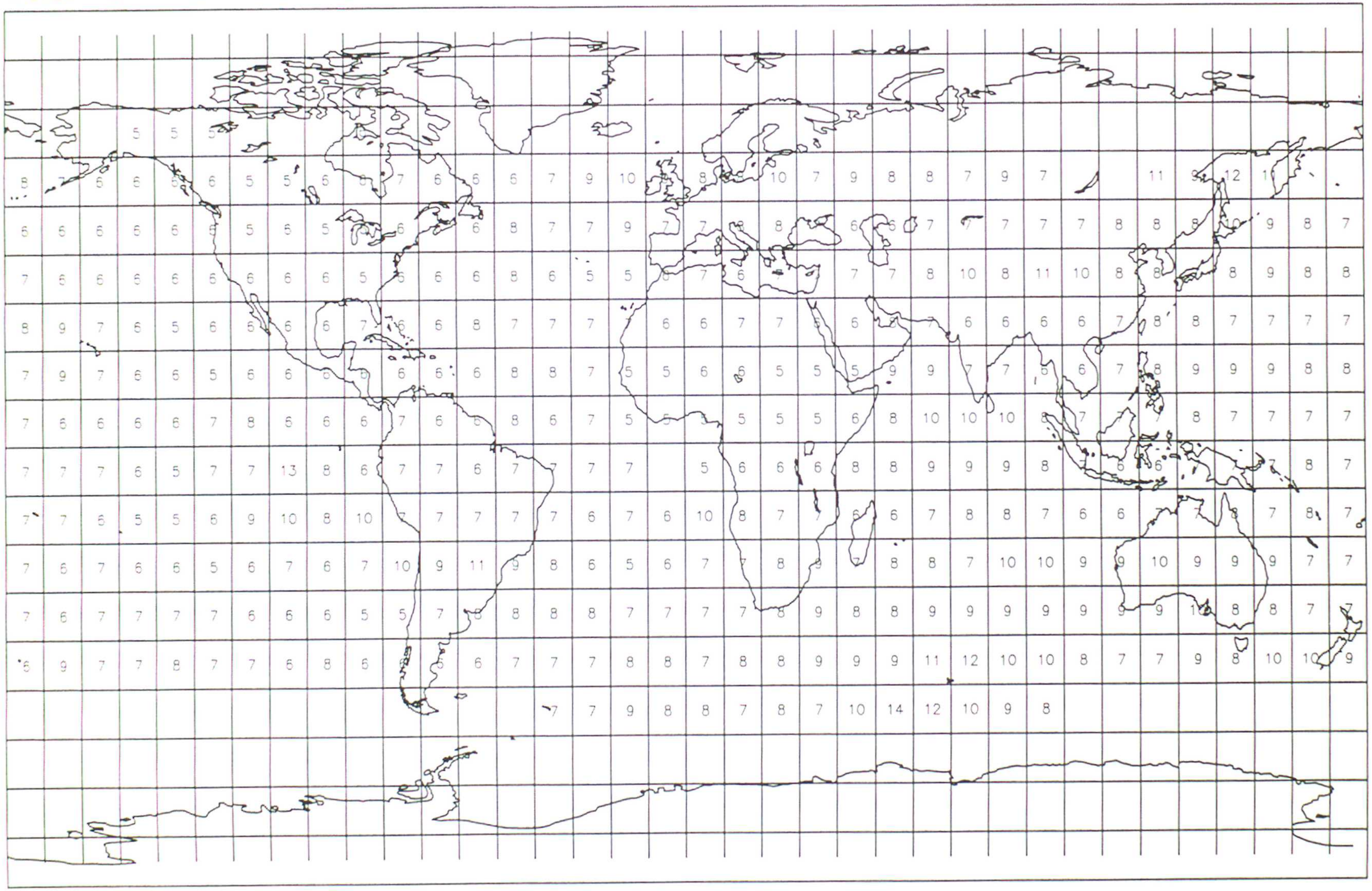

-1.2 -.1 .6
-.1 -1.4 -.2 1.0 -1.8 -.5 -.8 -1.1 -.1 .6 -.3 .0 -.8 -1.1 -2.4 -3.2 -1.5 -2.1 -.5 -.8 -2.5 -2.1 -3.2 -2.4 -5.0 -4.2 -1.2
.0 .0 .5 1.0 .4 .2 -.4 -1.1 -.6 -2.1 .2 .1 .4 1.3 .8 .5 .1 -1.7 -1.2 1.6 -1.5 -1.7 -2.1 -.8 .9 -1.8 -1.7 -2.2 -.9 -.8 -.2
.3 .5 1.0 .9 1.3 .9 .2 -1.0 -.3 .4 .6 -.3 .3 .2 .8 .0 -.5 .3 -.8 -2.2 -.8 -1.4 -1.0 -.2 .4 -1.7 -.9 -.8 .2 .4 -.5
1.5 2.2 2.1 1.3 .9 1.2 1.8 .0 .5 1.1 .6 -1.3 -1.3 1.1 .1 -.6 -.6 .6 -1.0 -.3 -.3 1.1 -.4 2.2 1.5 1.5 -.1 .9 .5 .3 1.4 .8 1.9 2.5 .5
2.1 2.7 1.0 .8 .9 .5 1.3 1.3 1.2 1.5 1.6 1.0 .8 1.6 1.8 1.6 1.5 .8 1.5 1.7 .8 -.6 .4 2.9 3.2 1.9 -1.2 -.4 .6 .8 .5 -.4 1.2 1.2 2.1 2.0
1.7 1.9 1.8 1.9 1.4 .5 1.9 1.6 1.3 1.3 .1 2.0 .8 .7 1.0 .4 -.2 .0 .8 .4 .3 2.6 1.7 1.7 .2 .6 1.6 1.4 1.8 1.7 1.6
1.7 1.9 1.1 1.9 .7 1.7 2.8 .5 .1 1.3 .4 1.9 2.1 2.7 2.7 2.7 4.3 .9 .7 1.2 1.7 2.9 1.5 -1.1 -1.9 -.7 -.8 1.6 .4 2.0 1.1 1.0
.9 2.0 -.2 -.7 -.4 -.2 .3 -.8 1.6 2.7 1.0 -.1 .1 1.0 .6 1.3 2.1 1.6 3.4 .7 2.4 1.5 1.2 2.6 4.1 3.8 1.5 2.1 .3 1.6 2.0 .8 2.0 1.4
1.3 .7 .4 .8 -1.0 .7 -.2 .2 .3 .9 3.6 -.8 -1.2 -.5 1.0 1.1 .6 1.4 1.1 .1 -1.0 .3 .6 .4 1.4 3.0 1.4 1.3 -.5 -.9 -2.1 -1.7 -1.0 .3 1.0 .9
.6 .1 1.0 .7 1.9 1.3 -.4 .5 .0 .7 .8 -1.0 .9 1.1 1.5 1.3 1.0 .7 .2 -1.3 -1.2 .0 .6 2.5 1.9 -1.9 -1.5 -2.4 -1.3 -2.7 -2.0 -.8 .3 .2
2.1 -2.8 .7 1.8 3.5 1.9 .9 1.9 1.5 1.2 .4 .3 -.8 .4 .8 .1 -.4 -.9 -1.8 -2.2 -1.3 -.2 1.0 .7 .7 -1.7 -1.4 -1.6 -1.1 -2.5 -2.9 -2.1 -3.6 -2.2 -.5
-1.7 -.9 -2.1 -1.2 -.7 -.9 -.8 -1.9 -.9 .8 1.5 -1.6 -1.1 -3.5

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24

OCTOBER 1998

USING ALL OBSERVATIONS

VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: October 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-11, NOAA-14 500 km.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :All SATEM soundings where number of observations > 30.

Data Extracted :Layer: 850 - 1000 hPa
100 - 300 hPa
30 - 50 hPa

:Mean observation minus background temperature differences

NO DATA AVAILABLE

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13502	17.0	-47.2	ALL	P	SUR	192	0	0	0.8	0.0	0.8
13503	18.9	-54.2	ALL	P	SUR	246	0	0	0.8	-0.3	0.9
13906	24.0	-49.9	ALL	P	SUR	234	0	0	0.9	-0.3	0.9
13913	14.7	-61.2	ALL	P	SUR	138	0	0	1.4	-0.3	1.4
41502	22.6	-44.2	ALL	P	SUR	207	0	0	0.7	0.0	0.7
41503	21.6	-57.6	ALL	P	SUR	255	0	0	0.8	0.1	0.8
41504	26.2	-64.2	ALL	P	SUR	272	0	0	0.9	0.3	0.9
41505	27.0	-63.9	ALL	P	SUR	263	0	0	0.8	0.3	0.9
41520	22.5	-44.4	ALL	P	SUR	228	0	0	0.8	0.5	0.9
41521	26.8	-58.9	ALL	P	SUR	279	0	0	0.9	0.0	0.9
41528	30.0	-68.9	ALL	P	SUR	268	0	0	0.8	0.3	0.8
41597	30.9	-25.9	ALL	P	SUR	603	0	0	0.7	0.1	0.7
41598	25.2	-46.1	ALL	P	SUR	774	18	2	0.9	0.2	0.9
41599	25.0	-39.9	ALL	P	SUR	695	1	0	0.8	-0.5	0.9
41601	19.0	-47.3	ALL	P	SUR	595	21	4	1.1	-0.5	1.2
41625	30.6	-68.5	ALL	P	SUR	273	0	0	0.9	0.1	0.9
41626	26.4	-72.7	ALL	P	SUR	266	0	0	0.9	0.2	0.9
41629	29.8	-69.2	ALL	P	SUR	270	0	0	0.8	0.1	0.8
41633	13.4	-55.6	ALL	P	SUR	460	15	3	1.1	0.4	1.2
41635	25.6	-53.6	ALL	P	SUR	547	15	3	1.1	1.0	1.5
41636	15.9	-50.6	ALL	P	SUR	654	24	4	1.0	0.1	1.0
41637	23.1	-46.4	ALL	P	SUR	301	2	1	0.9	0.0	0.9
41638	19.3	-59.6	ALL	P	SUR	538	0	0	1.2	0.3	1.2
42534	45.0	-27.4	ALL	P	SUR	1	0	0	0.0	-2.2	2.2
44601	53.7	-41.2	ALL	P	SUR	775	82	11	1.5	0.6	1.6
44602	52.7	-32.2	ALL	P	SUR	712	36	5	1.7	0.4	1.7
44603	51.6	-40.3	ALL	P	SUR	812	0	0	1.6	0.0	1.6
44604	44.6	-32.0	ALL	P	SUR	570	0	0	1.1	0.4	1.1
44606	53.2	-37.8	ALL	P	SUR	1065	0	0	1.6	0.1	1.6
44613	40.3	-30.9	ALL	P	SUR	682	8	1	1.1	-0.2	1.1
44617	56.0	-8.7	ALL	P	SUR	1168	12	1	1.8	0.2	1.8
44726	55.4	-35.6	ALL	P	SUR	937	7	1	1.8	0.0	1.8
44742	45.9	-21.4	ALL	P	SUR	736	2	0	1.2	-0.3	1.3
44743	44.6	-50.2	ALL	P	SUR	719	2	0	1.2	-0.7	1.4
44764	50.4	-47.2	ALL	P	SUR	504	3	1	1.5	-0.3	1.5
44767	53.5	-45.7	ALL	P	SUR	714	1	0	1.5	-0.7	1.7
44768	57.5	-13.3	ALL	P	SUR	1220	4	0	1.6	0.1	1.6
44770	57.1	-39.1	ALL	P	SUR	1389	0	0	1.4	-0.7	1.5
44772	49.5	-36.1	ALL	P	SUR	825	6	1	3.3	-0.3	3.3
44773	57.1	-9.9	ALL	P	SUR	1198	3	0	1.6	0.0	1.6
44774	52.1	-28.1	ALL	P	SUR	897	2	0	2.1	-1.3	2.4
44775	55.7	-33.0	ALL	P	SUR	1204	6	0	1.7	0.0	1.7
44776	49.4	-45.6	ALL	P	SUR	677	3	0	1.6	-0.1	1.6
44778	52.2	-52.0	ALL	P	SUR	917	3	0	1.4	-0.4	1.4
44779	46.2	-38.6	ALL	P	SUR	847	2	0	1.8	0.3	1.8
44780	58.8	-13.0	ALL	P	SUR	1284	6	0	1.6	-0.2	1.6
44901	55.9	-44.7	ALL	P	SUR	207	0	0	1.0	0.6	1.2
44912	53.6	-25.1	ALL	P	SUR	136	0	0	1.4	0.5	1.5
44925	53.7	-49.2	ALL	P	SUR	131	0	0	2.3	1.3	2.7
47556	75.5	-78.0	ALL	P	SUR	24	0	0	1.2	-0.4	1.2
48518	71.8	-21.0	ALL	P	SUR	596	0	0	1.1	-0.5	1.2
49810	13.6	-75.5	ALL	P	SUR	12	0	0	1.3	-0.2	1.3
62506	45.6	-6.8	ALL	P	SUR	498	0	0	1.0	0.2	1.1
62510	45.0	-4.8	ALL	P	SUR	59	0	0	1.9	1.0	2.2
62511	48.3	-16.4	ALL	P	SUR	660	236	36	1.7	0.5	1.8
62512	46.9	-18.1	ALL	P	SUR	472	83	18	1.7	0.1	1.7
62513	48.9	-16.2	ALL	P	SUR	601	147	24	2.4	0.1	2.4
62514	54.0	-33.1	ALL	P	SUR	235	1	0	2.2	1.2	2.6
62515	56.5	-32.2	ALL	P	SUR	1599	41	3	2.8	-0.3	2.8
62516	45.5	-11.8	ALL	P	SUR	27	0	0	2.0	-4.5	4.9

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
62517	49.8	-18.0	ALL	P	SUR	748	0	0	1.7	-0.4	1.8
62518	48.6	-19.4	ALL	P	SUR	794	181	23	3.0	1.3	3.2
62519	45.2	-21.3	ALL	P	SUR	1101	78	7	1.7	0.4	1.7
62520	44.2	-18.4	ALL	P	SUR	684	1	0	0.9	-0.3	0.9
62554	46.4	-16.5	ALL	P	SUR	720	0	0	1.0	0.3	1.0
62674	63.4	-20.3	ALL	P	SUR	263	0	0	1.5	-0.4	1.6
64528	59.2	-9.3	ALL	P	SUR	1580	2	0	1.5	-0.6	1.6
64529	61.3	-36.2	ALL	P	SUR	1216	3	0	1.4	-0.5	1.5
64561	47.8	-4.8	ALL	P	SUR	708	4	1	1.3	0.3	1.4
64563	59.4	-25.5	ALL	P	SUR	203	4	2	1.7	-0.6	1.8
65562	60.7	-31.1	ALL	P	SUR	1703	2	0	1.5	-0.4	1.5
65571	59.3	-27.5	ALL	P	SUR	1342	8	1	1.8	-0.5	1.8
65581	57.2	-36.9	ALL	P	SUR	696	0	0	1.6	-0.6	1.7
65591	56.6	-44.2	ALL	P	SUR	841	5	1	1.4	-0.3	1.4
65592	63.5	-32.8	ALL	P	SUR	1455	7	0	1.7	-0.4	1.8
65597	43.4	-38.2	ALL	P	SUR	1265	94	7	2.3	-0.5	2.4
65599	60.0	-36.1	ALL	P	SUR	1071	17	2	2.5	-0.1	2.5
99810	46.3	-30.9	ALL	P	SUR	3	1	33	1.3	-1.5	2.0
WIND SPEED											
13502	17.0	-47.2	ALL	SPEED	SUR	237	0	0	3.1	0.0	3.1
13503	18.9	-54.2	ALL	SPEED	SUR	323	0	0	1.6	-1.8	2.4
41501	20.1	-47.9	ALL	SPEED	SUR	259	1	0	3.6	-0.2	3.6
41504	26.2	-64.2	ALL	SPEED	SUR	349	0	0	2.1	0.4	2.1
41520	22.5	-44.4	ALL	SPEED	SUR	299	4	1	3.8	6.0	7.1
41521	26.8	-58.9	ALL	SPEED	SUR	406	0	0	1.9	-0.4	1.9
41522	14.1	-61.1	ALL	SPEED	SUR	260	0	0	3.2	-1.6	3.5
41523	20.0	-58.9	ALL	SPEED	SUR	52	0	0	0.7	-4.3	4.3
41598	25.2	-46.1	ALL	SPEED	SUR	810	3	0	1.9	0.0	1.9
41599	25.0	-39.9	ALL	SPEED	SUR	746	0	0	1.7	0.1	1.7
41601	19.0	-47.3	ALL	SPEED	SUR	504	0	0	1.7	-0.4	1.7
41625	30.6	-68.5	ALL	SPEED	SUR	353	0	0	1.7	-0.2	1.7
41626	26.4	-72.7	ALL	SPEED	SUR	330	0	0	1.7	-1.2	2.1
41629	29.8	-69.2	ALL	SPEED	SUR	376	0	0	2.1	-0.6	2.2
41633	13.4	-55.6	ALL	SPEED	SUR	386	0	0	2.2	0.7	2.3
41635	25.6	-53.6	ALL	SPEED	SUR	563	0	0	2.0	0.7	2.1
41636	15.9	-50.6	ALL	SPEED	SUR	542	0	0	2.2	-0.4	2.2
41637	23.1	-46.4	ALL	SPEED	SUR	256	0	0	1.6	0.3	1.6
41638	19.3	-59.6	ALL	SPEED	SUR	427	0	0	1.7	-0.3	1.7
42534	45.0	-27.4	ALL	SPEED	SUR	1	0	0	0.0	-1.5	1.5
44601	53.7	-41.2	ALL	SPEED	SUR	530	0	0	3.0	1.4	3.3
44602	52.7	-32.2	ALL	SPEED	SUR	483	0	0	2.6	1.0	2.8
44613	40.3	-30.9	ALL	SPEED	SUR	3	0	0	9.3	31.3	32.7
44617	56.0	-8.7	ALL	SPEED	SUR	1	0	0	0.0	37.9	37.9
44743	44.6	-50.2	ALL	SPEED	SUR	1	1	100	0.0	0.0	0.0
44773	57.1	-9.9	ALL	SPEED	SUR	1423	1	0	3.3	-3.4	4.7
49810	13.6	-75.5	ALL	SPEED	SUR	9	0	0	1.6	2.8	3.2
62517	49.8	-18.0	ALL	SPEED	SUR	868	0	0	1.9	-0.2	1.9
65599	60.0	-36.1	ALL	SPEED	SUR	1407	3	0	3.2	0.5	3.2
99810	46.3	-30.9	ALL	SPEED	SUR	4	0	0	1.0	1.7	2.0
WIND DIRECTION											
13502	17.0	-47.2	ALL	DIRN.	SUR	134	0	0	19.8	-22.6	30.1
13503	18.9	-54.2	ALL	DIRN.	SUR	142	0	0	25.4	11.0	27.6
19732	60.1	-8.4	ALL	DIRN.	SUR	1	0	0	0.0	9.5	9.5
41501	20.1	-47.9	ALL	DIRN.	SUR	152	1	1	19.9	-7.4	21.2
41502	22.6	-44.2	ALL	DIRN.	SUR	202	0	0	39.1	-9.5	40.2
41503	21.6	-57.6	ALL	DIRN.	SUR	247	0	0	37.2	35.3	51.3
41504	26.2	-64.2	ALL	DIRN.	SUR	164	0	0	28.1	11.4	30.3
41520	22.5	-44.4	ALL	DIRN.	SUR	148	4	3	20.7	-11.0	23.4
41521	26.8	-58.9	ALL	DIRN.	SUR	146	0	0	22.0	-8.0	23.4
41522	14.1	-61.1	ALL	DIRN.	SUR	121	0	0	29.7	1.7	29.7

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND DIRECTION											
41523	20.0	-58.9	ALL	DIRN.	SUR	186	0	0	0.0	2.5	2.5
41598	25.2	-46.1	ALL	DIRN.	SUR	236	3	1	22.6	0.2	22.6
41599	25.0	-39.9	ALL	DIRN.	SUR	164	0	0	29.1	0.8	29.1
41601	19.0	-47.3	ALL	DIRN.	SUR	257	0	0	39.8	-18.9	44.1
41625	30.6	-68.5	ALL	DIRN.	SUR	179	0	0	16.9	11.8	20.6
41626	26.4	-72.7	ALL	DIRN.	SUR	164	0	0	28.2	7.9	29.3
41629	29.8	-69.2	ALL	DIRN.	SUR	156	0	0	21.2	5.7	22.0
41633	13.4	-55.6	ALL	DIRN.	SUR	226	0	0	19.1	13.3	23.3
41636	15.9	-50.6	ALL	DIRN.	SUR	333	0	0	22.2	8.2	23.6
41637	23.1	-46.4	ALL	DIRN.	SUR	133	0	0	23.4	-2.3	23.5
41638	19.3	-59.6	ALL	DIRN.	SUR	243	0	0	17.0	12.0	20.8
44601	53.7	-41.2	ALL	DIRN.	SUR	394	0	0	26.6	1.4	26.6
44602	52.7	-32.2	ALL	DIRN.	SUR	338	0	0	28.8	4.8	29.2
44743	44.6	-50.2	ALL	DIRN.	SUR	1	1	100	0.0	0.0	0.0
44773	57.1	-9.9	ALL	DIRN.	SUR	804	1	0	40.6	-1.4	40.6
49810	13.6	-75.5	ALL	DIRN.	SUR	7	0	0	7.8	18.7	20.2
62517	49.8	-18.0	ALL	DIRN.	SUR	569	0	0	23.7	-17.7	29.6
65599	60.0	-36.1	ALL	DIRN.	SUR	688	3	0	29.9	12.0	32.2
99810	46.3	-30.9	ALL	DIRN.	SUR	2	0	0	4.2	-20.8	21.2

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures:
Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3967	1	32	2.0	-0.1	2879	0	17	0	8.3	1.0
ACA	1300	1	14	2.1	0.1	1154	0	7	0	7.4	0.6
AEA	273	1	33	2.3	0.8	240	0	31	1	10.0	0.6
AEL	302	1	21	2.3	0.3	303	0	21	0	9.3	0.2
AEY	30	0	3	1.5	0.6	30	3	7	0	6.9	-1.1
AFL	453	0	12	2.1	0.5	411	1	7	0	7.9	1.0
AFR	1274	0	16	1.9	0.1	1249	0	15	0	8.1	1.0
AIH	107	2	8	1.4	-0.3	103	0	7	0	8.8	0.7
AJM	60	0	10	1.9	-0.4	55	2	7	0	7.3	-0.2
AMX	209	0	6	1.9	0.1	209	0	4	0	9.9	1.5
ANZ	133	1	7	1.8	-1.1	132	0	6	0	6.1	0.2
AOM	230	0	5	1.6	0.7	230	0	5	0	7.5	0.5
AUA	41	0	32	2.3	0.3	26	0	19	0	9.1	1.1
AVA	171	1	8	1.9	0.0	173	1	8	1	10.3	0.1
AZA	357	10	39	3.3	0.9	309	0	18	0	9.7	0.6
BAL	437	1	25	1.8	-0.4	431	0	23	0	8.0	1.1
BAW	1638	0	25	2.0	-0.1	1421	0	19	0	8.2	0.8
BWA	111	0	11	1.6	1.0	104	1	9	0	8.6	1.7
CDN	840	0	13	1.8	0.3	739	0	7	0	7.4	1.1
CFG	509	0	10	1.9	-0.9	485	1	7	0	9.5	0.0
CKT	126	1	28	1.9	0.7	108	0	16	0	8.6	0.7
CLX	361	1	12	2.1	-0.7	331	0	5	0	7.8	0.4
CMM	313	1	23	1.9	0.0	253	0	9	0	7.2	0.6
COA	881	1	24	2.0	-0.1	694	0	20	1	13.0	2.1
CRL	193	0	8	1.9	0.4	190	1	7	0	8.3	0.8
CTB	221	0	2	1.7	-0.8	224	0	5	0	8.4	1.0
CUB	241	1	12	1.8	0.7	238	0	12	0	8.7	0.8
DAL	2059	0	34	2.1	-0.5	1511	0	23	0	9.0	0.8
DBY	178	1	6	1.9	-1.0	183	1	5	0	8.2	0.8
DHL	34	6	100	5.5	-3.5	27	0	22	0	10.7	1.3
DLH	2286	0	20	1.8	0.0	2029	0	15	0	8.0	0.8
EIN	29	0	28	2.2	-0.1	25	0	20	0	14.5	2.7
ELY	110	0	11	1.6	0.1	109	1	85	6	8.5	1.1
EWW	73	0	30	1.8	0.2	51	0	100	0	8.7	0.9
FDX	557	0	35	1.9	0.4	389	0	18	0	8.3	1.6
FIN	304	0	24	2.1	0.5	238	1	13	0	7.7	0.2
GAF	29	0	14	1.8	-0.7	29	0	7	0	9.7	4.3
GTI	64	2	41	2.6	0.3	52	0	29	0	10.7	0.2
HLF	37	0	14	1.5	-0.8	37	0	8	0	7.7	3.2
IBE	1153	1	28	1.8	0.6	1081	0	26	0	9.4	0.8
ICE	1023	1	76	1.9	0.1	789	0	15	0	7.1	0.2
JKK	133	2	23	1.4	0.1	110	1	17	0	9.0	1.1
KLM	2098	0	23	1.6	0.0	2040	0	21	0	7.8	0.9
LDA	64	0	25	1.9	-0.5	62	0	23	2	9.7	0.6
LDI	244	1	42	3.5	2.3	209	0	35	0	10.7	-0.2
LEI	101	3	21	1.4	0.5	89	0	11	0	6.9	1.1
LIB	76	3	13	2.1	0.8	76	0	9	0	6.9	1.1
LOT	180	1	24	1.9	-1.1	139	0	14	1	6.6	-0.1
LTU	438	0	20	1.8	-0.2	383	1	13	0	7.9	0.9
LXR	41	0	20	1.7	0.8	41	0	20	0	12.5	0.9
MAS	57	0	23	1.6	-0.2	52	0	21	0	9.5	2.0
MON	141	4	13	1.9	0.0	127	1	6	0	9.7	2.3
MPD	76	1	17	2.4	1.1	66	0	8	0	8.2	1.1
MPH	548	0	11	1.8	-0.5	509	0	5	0	7.2	0.9
NCA	23	0	0	1.5	0.5	21	0	0	0	6.7	0.3
NWA	3196	1	10	2.0	0.7	2964	0	6	0	8.5	0.7
PAC	97	0	28	2.2	0.6	74	0	19	0	10.9	0.5
RAM	61	0	8	2.6	0.3	61	0	5	0	11.4	0.6
RCH	97	4	23	2.5	0.5	91	2	25	0	13.4	0.8

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
RJA	43	0	28	2.3	1.3	34	0	12	0	7.1	0.3
ROY	55	2	15	1.5	-0.2	48	0	6	0	8.0	1.5
RRR	84	1	29	1.6	-0.3	74	0	28	0	8.0	0.3
SAB	84	1	19	1.6	0.1	75	0	8	0	6.2	1.8
SAS	1190	0	2	1.9	0.0	1185	0	2	0	7.2	0.2
SIA	117	0	8	2.1	-0.8	121	0	9	0	8.7	1.5
SLR	89	0	21	1.7	-0.5	90	1	23	0	9.3	0.8
SVA	68	1	10	1.8	0.0	73	0	7	0	7.3	0.7
SWR	227	0	22	1.6	-0.2	186	1	14	0	8.6	1.6
TAP	303	0	8	1.3	-0.3	299	0	7	0	8.1	1.1
TOW	118	5	29	1.8	0.1	94	0	16	3	7.8	0.4
TSC	69	0	7	1.9	0.1	66	0	5	0	7.9	1.2
TWA	1061	1	35	2.3	0.5	755	0	21	0	8.8	1.1
UAL	1873	0	15	2.0	-0.1	1649	0	9	0	7.8	0.8
UPS	660	2	37	2.1	0.2	553	0	32	0	9.5	0.9
USA	218	0	35	2.1	-0.1	169	1	22	0	9.4	0.6
VIR	282	0	12	1.9	-0.4	261	0	6	0	7.7	1.0
VKG	76	0	16	1.7	0.4	71	1	10	0	6.4	0.5
WOA	80	0	16	1.7	0.1	73	0	11	0	10.6	2.7
BA	7614	0	10	1.7	0.2	7612	0	9	0	6.8	1.2
KL	2603	0	0	1.8	1.1	2602	0	1	0	7.0	0.9
LH	313	0	0	1.7	0.9	313	0	1	0	6.4	0.8
N	365	2	21	2.5	0.4	327	0	11	1	10.1	0.1
ADS	105	0	1	1.4	0.0	105	0	86	0	6.1	-0.1
US ACAR	14019	0	3	1.6	0.4	14012	0	1	0	7.2	1.1

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix 1.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBBH	00	Z	100	3	0	31.8	39.3	23.0
DBBH	12	Z	100	12	1	24.6	27.7	12.7
DBLK	00	Z	100	1	0	0.0	22.0	22.0
DBLK	12	Z	100	9	0	8.5	10.2	5.6
ELML7	00	Z	100	14	0	15.4	15.6	-2.5
ELML7	12	Z	100	11	0	20.4	33.7	26.9
FNOR	00	Z	100	14	0	63.0	63.8	-9.8
FNOR	12	Z	100	11	0	12.1	14.7	8.3
FNOU	00	Z	100	12	0	5.2	8.3	6.5
FNOU	12	Z	100	10	0	8.3	9.8	5.1
FNPH	00	Z	100	13	0	21.9	21.9	-0.9
FNPH	12	Z	100	15	0	11.6	14.2	-8.1
FNRS	00	Z	100	7	0	8.0	9.0	4.1
FNRS	12	Z	100	5	0	15.1	15.7	-4.4
FNVS	00	Z	100	1	0	0.0	21.0	21.0
JBOA	00	Z	100	1	0	0.0	7.0	7.0
JCCX	00	Z	100	1	0	0.0	23.0	23.0
JDWX	00	Z	100	1	0	0.0	45.0	45.0
LDWR	00	Z	100	21	0	13.3	14.6	-6.0
LDWR	12	Z	100	21	0	10.8	11.2	3.1
OVYA2	00	Z	100	11	0	14.2	17.9	-11.0
OVYA2	12	Z	100	10	0	25.3	25.4	2.8
OXYH2	00	Z	100	14	0	9.9	26.6	-24.7
OXYH2	12	Z	100	14	0	28.3	31.0	-12.7
SHIPAQ	00	Z	100	1	0	0.0	55.0	55.0
SHIPS	00	Z	100	1	0	0.0	1.0	-1.0
V2VM	00	Z	100	12	1	13.4	14.6	-5.7
V2VM	12	Z	100	8	0	26.6	27.4	-6.6
V2XM	00	Z	100	7	0	16.3	27.6	22.3
V2XM	12	Z	100	7	0	17.8	24.3	16.6
ZDLP	00	Z	100	1	0	0.0	121.0	121.0
03953	00	Z	100	24	0	14.3	14.7	3.5
03953	12	Z	100	22	0	15.6	16.3	4.6
04018	00	Z	100	28	0	11.3	13.6	7.6
04018	12	Z	100	24	0	55.1	55.1	0.2
04220	00	Z	100	6	0	3.9	12.9	12.3
04220	12	Z	100	4	0	7.8	11.6	8.5
04270	00	Z	100	26	0	18.7	19.0	-3.0
04270	12	Z	100	27	0	14.3	15.5	-6.1
04339	00	Z	100	25	1	15.0	17.6	9.2
04339	12	Z	100	22	0	12.4	17.7	12.6
04360	00	Z	100	26	0	12.7	14.6	7.3
04360	12	Z	100	28	0	14.8	15.0	2.6
08001	00	Z	100	21	0	14.6	14.6	0.7
08001	12	Z	100	26	0	17.7	18.1	3.8
08508	00	Z	100	1	0	0.0	13.0	-13.0
08508	12	Z	100	13	0	22.0	25.3	-12.5
08594	00	Z	100	1	0	0.0	29.0	29.0
08594	12	Z	100	20	0	18.7	25.3	17.0
60020	00	Z	100	28	0	11.5	11.9	2.9
60020	12	Z	100	26	0	12.6	12.6	-0.2
71600	00	Z	100	28	0	10.9	14.6	9.8
71600	12	Z	100	29	0	15.6	15.9	3.2
72201	00	Z	100	27	0	14.9	16.2	6.4
72201	12	Z	100	26	0	11.2	13.6	7.7
72402	00	Z	100	25	0	16.5	20.3	11.9
72402	12	Z	100	27	0	19.2	30.8	24.0
74494	00	Z	100	15	1	12.3	12.4	1.4
74494	12	Z	100	17	0	9.1	13.8	-10.4
78016	00	Z	100	27	0	11.9	17.4	12.7
78016	12	Z	100	28	0	12.1	17.5	12.6

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
CGDX	00	Z	500	1	0	0.0	15.0	15.0
DBBH	00	Z	500	5	0	6.4	11.1	9.0
DBBH	12	Z	500	16	1	15.7	24.6	18.9
DBLK	00	Z	500	1	0	0.0	1.0	-1.0
DBLK	12	Z	500	9	0	20.9	20.9	0.9
ELML7	00	Z	500	14	0	11.1	19.3	15.8
ELML7	12	Z	500	12	0	13.1	25.6	21.9
FNOR	00	Z	500	15	0	8.2	14.3	11.8
FNOR	12	Z	500	13	0	7.6	17.3	15.5
FNOU	00	Z	500	14	0	13.1	17.9	12.2
FNOU	12	Z	500	11	0	7.7	14.0	11.7
FNPH	00	Z	500	14	0	10.9	12.6	6.1
FNPH	12	Z	500	16	0	8.9	12.3	8.5
FNRS	00	Z	500	7	0	7.4	9.5	6.0
FNRS	12	Z	500	5	0	5.2	8.4	6.6
FNVS	00	Z	500	1	0	0.0	16.0	16.0
JBOA	00	Z	500	1	0	0.0	12.0	12.0
JCCX	00	Z	500	1	0	0.0	26.0	26.0
JDWX	00	Z	500	1	0	0.0	16.0	16.0
LDWR	00	Z	500	22	0	8.7	9.2	2.8
LDWR	12	Z	500	22	0	10.2	10.2	-0.2
OVYA2	00	Z	500	11	0	8.6	17.5	-15.2
OVYA2	12	Z	500	10	0	17.3	19.2	-8.4
OXYH2	00	Z	500	16	0	12.4	21.4	-17.4
OXYH2	12	Z	500	16	0	16.6	25.0	-18.7
SHIPAQ	00	Z	500	1	0	0.0	19.0	19.0
SHIPS	00	Z	500	1	0	0.0	0.0	0.0
SHIPS	12	Z	500	1	0	0.0	11.0	11.0
V2VM	00	Z	500	14	0	28.6	32.0	14.2
V2VM	12	Z	500	9	0	11.7	13.6	7.0
V2XM	00	Z	500	9	0	20.9	26.7	16.7
V2XM	12	Z	500	8	0	21.6	23.0	7.9
ZDLP	00	Z	500	1	0	0.0	82.0	82.0
03953	00	Z	500	28	0	12.5	16.0	10.0
03953	12	Z	500	29	0	13.7	16.7	9.6
04018	00	Z	500	29	0	11.7	12.6	4.8
04018	12	Z	500	28	0	11.2	13.0	6.7
04220	00	Z	500	29	0	16.5	16.5	-0.2
04220	12	Z	500	26	1	13.2	13.5	-2.8
04270	00	Z	500	27	0	14.6	14.9	-2.7
04270	12	Z	500	28	0	13.3	13.4	1.1
04339	00	Z	500	26	1	9.6	13.4	9.4
04339	12	Z	500	28	0	10.6	13.9	8.9
04360	00	Z	500	28	0	9.9	10.2	2.3
04360	12	Z	500	28	0	10.2	10.9	3.8
08001	00	Z	500	29	0	12.6	15.9	9.7
08001	12	Z	500	29	0	11.6	13.9	7.7
08508	00	Z	500	1	0	0.0	10.0	10.0
08508	12	Z	500	27	0	17.3	19.9	9.9
08594	00	Z	500	1	0	0.0	11.0	11.0
08594	12	Z	500	24	0	9.5	14.3	10.7
60020	00	Z	500	28	0	7.9	12.1	9.2
60020	12	Z	500	28	0	8.2	14.5	11.9
71600	00	Z	500	28	0	13.0	13.0	0.2
71600	12	Z	500	29	0	12.7	12.8	1.6
72201	00	Z	500	27	0	5.4	9.2	7.4
72201	12	Z	500	26	0	5.2	6.0	2.8
72402	00	Z	500	25	0	8.6	8.8	1.6
72402	12	Z	500	27	0	12.0	12.1	-2.0
74494	00	Z	500	26	1	11.1	12.7	6.0
74494	12	Z	500	27	0	9.0	9.1	-1.4
78016	00	Z	500	27	0	6.6	22.5	21.6
78016	12	Z	500	28	0	8.1	20.5	18.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in $m\ s^{-1}$
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBBH	00	V	100	2	0	0	0.0	-1.2	-2.3
DBBH	12	V	100	9	0	0	0.0	-1.5	0.0
DBLK	00	V	100	1	0	0	0.0	-1.2	-3.4
DBLK	12	V	100	8	0	0	0.0	-0.8	-1.1
ELML7	00	V	100	13	0	0	0.0	1.4	0.7
ELML7	12	V	100	10	0	0	3.3	1.5	1.6
FNOR	00	V	100	13	0	0	2.7	-1.3	0.5
FNOR	12	V	100	11	0	0	2.4	-0.2	1.7
FNOU	00	V	100	10	0	0	2.2	0.1	0.9
FNOU	12	V	100	8	0	0	1.9	0.4	-0.4
FNPH	00	V	100	13	0	0	1.9	0.1	-0.5
FNPH	12	V	100	13	0	0	3.2	0.4	0.5
FNRS	00	V	100	7	0	0	2.9	0.3	-0.7
FNRS	12	V	100	5	0	0	2.9	-1.6	-1.2
FNVS	00	V	100	1	0	0	2.9	1.2	1.1
JBOA	00	V	100	1	0	0	2.9	-0.3	0.8
JCCX	00	V	100	1	0	0	2.9	1.0	3.7
JDWX	00	V	100	1	0	0	2.9	-2.5	-2.2
LDWR	00	V	100	21	0	0	2.9	0.7	0.1
LDWR	12	V	100	21	0	0	2.5	-0.3	0.3
OVYA2	00	V	100	9	0	0	2.2	-0.6	1.7
OVYA2	12	V	100	10	0	0	2.2	0.5	-0.6
OXYH2	00	V	100	12	0	0	2.3	-1.0	-0.1
OXYH2	12	V	100	13	0	0	4.6	-0.1	1.1
SHIPAQ	00	V	100	1	0	0	2.7	12.6	-8.1
SHIPS	00	V	100	1	0	0	2.7	4.2	-2.6
V2VM	00	V	100	13	0	0	2.7	0.8	0.4
V2VM	12	V	100	5	0	0	4.7	-0.2	2.7
V2XM	00	V	100	6	0	0	4.7	0.4	-0.7
V2XM	12	V	100	7	0	0	4.7	1.0	-0.4
03953	00	V	100	23	0	0	4.3	0.0	0.8
03953	12	V	100	22	0	0	3.2	-0.4	0.8
04018	00	V	100	17	0	0	3.1	-1.2	0.2
04018	12	V	100	18	0	0	2.9	0.1	-0.6
04220	00	V	100	6	0	0	2.3	-1.4	0.7
04220	12	V	100	4	0	0	2.3	1.3	1.2
04270	00	V	100	23	0	0	2.3	-0.1	1.5
04270	12	V	100	26	0	0	3.7	-1.1	1.2
04339	00	V	100	18	0	16	2.6	-1.4	0.8
04339	12	V	100	21	0	0	4.4	-0.5	0.1
04360	00	V	100	20	0	0	3.4	-1.6	0.8
04360	12	V	100	28	0	0	4.0	-0.2	0.6
08001	00	V	100	21	0	0	4.9	1.7	3.9
08001	12	V	100	23	0	0	4.1	0.0	1.0
08508	12	V	100	9	0	0	3.0	2.1	-1.1
71600	00	V	100	28	0	3	2.0	0.5	-0.6
71600	12	V	100	27	0	0	3.7	-0.8	1.1
72201	00	V	100	27	0	0	3.7	0.3	1.5
72201	12	V	100	26	0	0	2.3	0.6	-0.4
72402	00	V	100	25	0	0	2.9	-1.2	0.5
72402	12	V	100	27	0	0	2.6	-0.3	-0.2
74494	00	V	100	13	0	0	3.7	-0.9	0.3
74494	12	V	100	16	0	0	2.1	-0.8	1.6
78016	00	V	100	27	0	0	5.0	0.5	0.7
78016	12	V	100	28	0	0	3.4	1.3	0.6

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: October 1998

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in $m\ s^{-1}$
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
CGDX	00	V	500	1	0	0	0.0	-2.6	0.0
DBBH	00	V	500	2	0	0	0.0	1.6	-3.1
DBBH	12	V	500	15	0	0	0.0	-1.3	-0.9
DBLK	00	V	500	1	0	0	2.8	0.7	5.2
DBLK	12	V	500	9	0	0	2.8	-1.2	-1.5
ELML7	00	V	500	13	0	0	2.8	-0.5	-0.4
ELML7	12	V	500	10	0	0	1.9	-1.4	0.3
FNOR	00	V	500	13	0	0	3.0	-0.7	0.7
FNOR	12	V	500	13	0	0	2.9	-0.1	-0.4
FNOU	00	V	500	12	0	0	2.6	0.9	-1.4
FNOU	12	V	500	10	0	0	3.9	1.4	1.5
FNPH	00	V	500	10	0	0	5.4	0.9	0.0
FNPH	12	V	500	15	0	0	3.2	0.2	0.5
FNRS	00	V	500	7	0	0	2.0	-0.4	-0.5
FNRS	12	V	500	5	0	0	2.0	1.4	-1.2
FNVS	00	V	500	1	0	0	2.0	3.0	-0.7
JBOA	00	V	500	1	0	0	2.0	0.3	-0.9
JDWX	00	V	500	1	0	0	2.0	-0.1	0.8
LDWR	00	V	500	22	0	0	4.7	-0.2	0.2
LDWR	12	V	500	22	0	0	4.0	-0.8	-0.5
OVYA2	00	V	500	10	0	0	2.5	1.4	-1.0
OVYA2	12	V	500	10	0	0	3.3	-0.9	0.2
OXYH2	00	V	500	13	0	0	3.7	0.8	1.4
OXYH2	12	V	500	15	0	0	5.5	0.1	-1.1
SHIPAQ	00	V	500	1	0	0	4.2	5.7	6.3
SHIPS	00	V	500	1	0	0	4.2	0.2	6.6
V2VM	00	V	500	14	0	0	4.2	0.3	-1.2
V2VM	12	V	500	8	0	0	3.4	0.0	-0.5
V2XM	00	V	500	8	0	0	3.4	1.8	1.1
V2XM	12	V	500	8	0	0	3.4	2.1	0.2
03953	00	V	500	28	0	0	3.4	0.1	0.6
03953	12	V	500	29	0	0	4.0	0.6	0.1
04018	00	V	500	28	0	0	4.2	1.2	0.1
04018	12	V	500	25	0	0	5.2	1.6	-0.9
04220	00	V	500	26	0	0	3.9	0.6	-0.9
04220	12	V	500	25	0	0	4.5	-0.6	-0.1
04270	00	V	500	26	0	0	4.0	-0.9	0.2
04270	12	V	500	27	0	0	3.8	0.2	0.0
04339	00	V	500	19	0	5	3.1	-1.4	-0.2
04339	12	V	500	28	0	0	4.9	-0.4	-0.5
04360	00	V	500	25	0	8	4.1	0.3	0.1
04360	12	V	500	28	0	3	4.7	-0.6	-0.3
08001	00	V	500	29	0	0	4.0	0.9	-0.1
08001	12	V	500	28	0	0	4.0	-0.3	-1.5
08508	12	V	500	23	0	0	2.6	-1.3	-1.0
60020	12	V	500	2	0	0	2.9	0.1	1.3
71600	00	V	500	28	0	0	2.9	1.0	0.8
71600	12	V	500	29	0	0	2.9	0.8	1.3
72201	00	V	500	27	0	0	5.4	0.5	-1.2
72201	12	V	500	25	0	0	2.2	-0.4	-0.9
72402	00	V	500	25	0	0	2.6	0.9	0.3
72402	12	V	500	27	0	0	2.2	1.3	0.2
74494	00	V	500	26	0	0	2.0	-0.2	0.5
74494	12	V	500	27	0	0	3.4	0.6	1.2
78016	00	V	500	27	0	0	2.9	0.0	-0.1
78016	12	V	500	28	0	0	2.8	0.4	-0.3

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45